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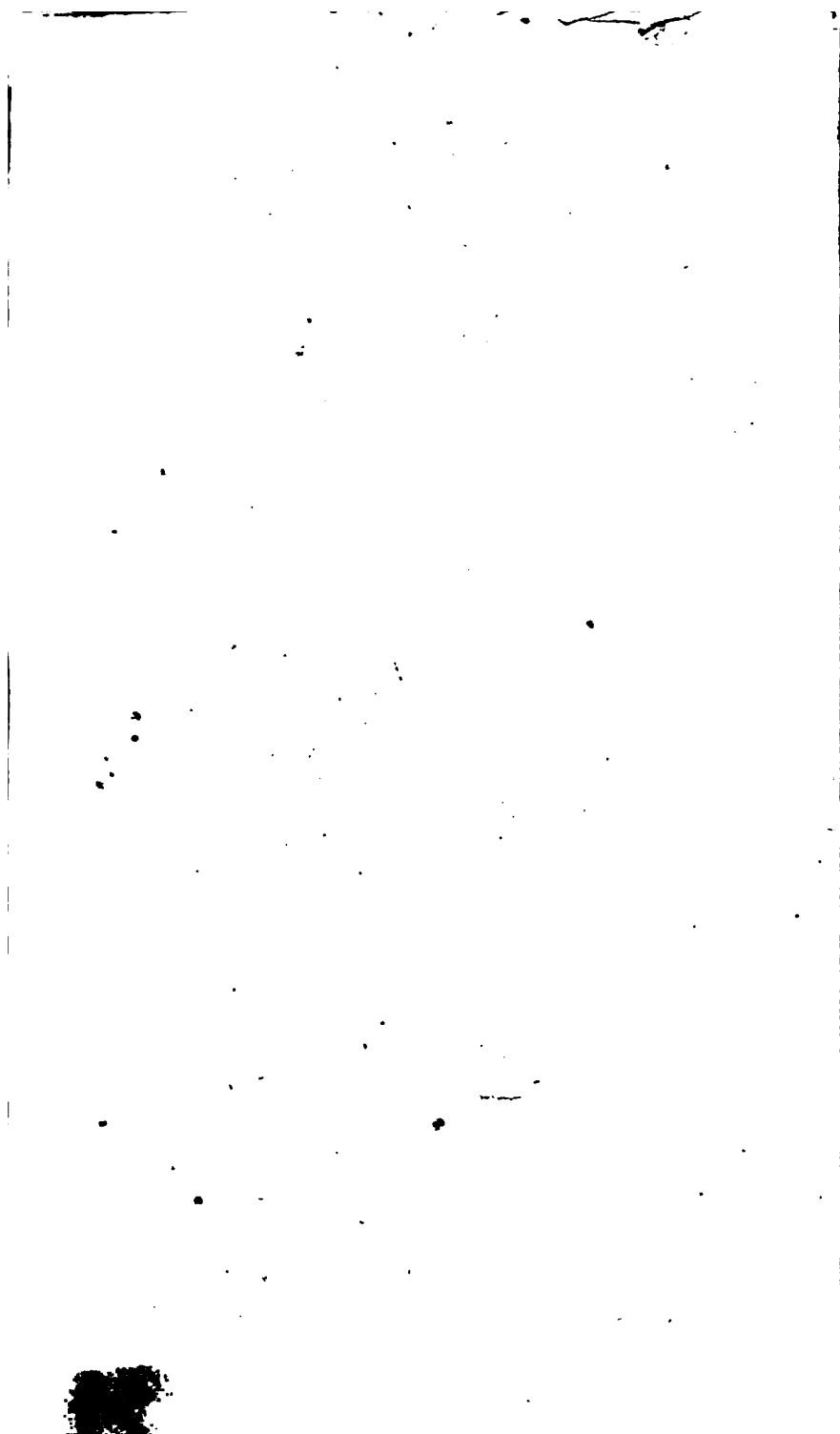


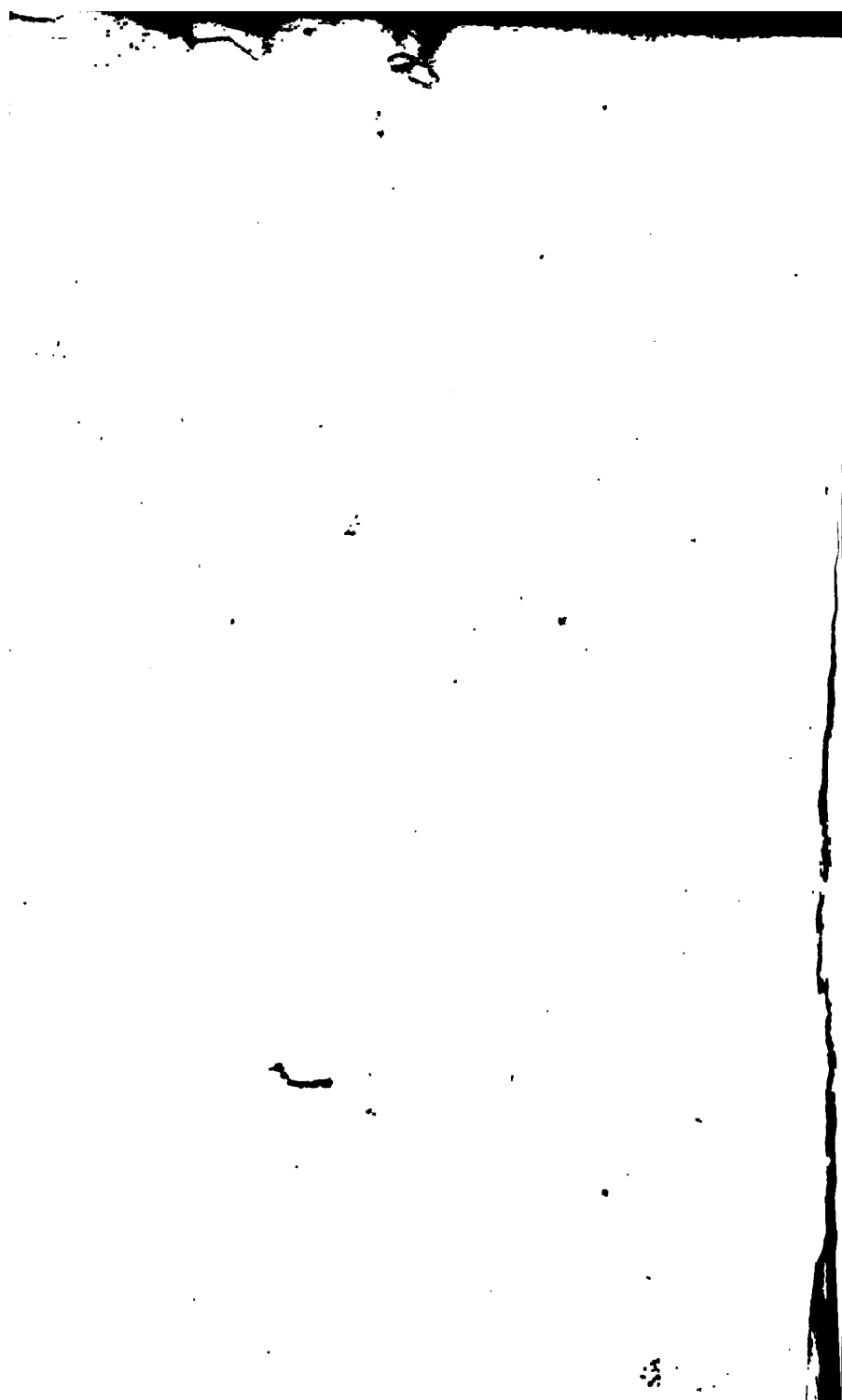
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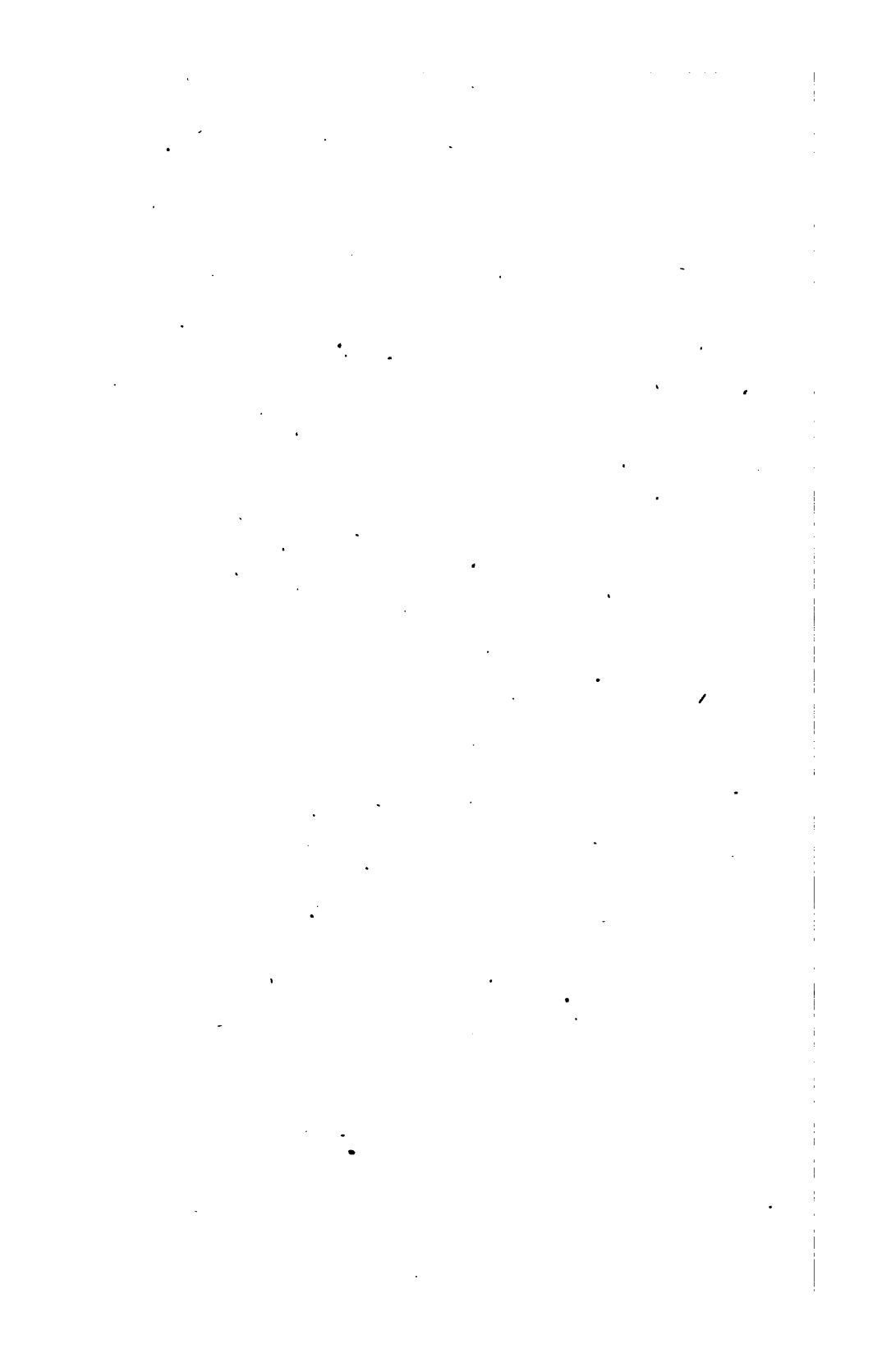
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OBSERVATIONS IN HUSBANDRY.

By EDWARD LISLE, Esq;

L A T E O F

CRUX-EASTON, in HAMPSHIRE.

*Satis mirari non possum, quòd animi sibi quisque formatorem præcepto-
remque virtutis è cœtu sapientium arceffat; sola res rustica, quæ sine
dubitatione proxima & quasi consanguinea sapientiæ est, tam discipulis
egeat quam magistris. Adhuc enim scholas rhetorum, & geometrarum,
musicorumque, vel, quod magis mirandum est, contemptissimorum vitio-
rum officinas, gulosius condiendi cibos, & luxuriosius fercula struendi,
capitumque & capillorum concinnatores non solum esse audiri, sed & ipse
vidi: agricolationis neque doctores qui se profiterentur, neque discipulos
cognovi. Cùm etiam, si prædictarum artium civitas egeret, tamen, sicut
apud præfatos, florere posset respublica; nam sine ludicris artibus, atque
etiam sine caufidiciis olim satis felices fuere futuræque sunt urbes; at sine
agricultoribus nec consistere mortales, nec ali posse manifestum est.*

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OBSERVATIONS IN HUSBANDRY.

FATTING of CATTLE.

§. 1.  HO' grafs of a middling good-
nefs may raife a beaft to be half fat, yet fuch grafs, tho' the bite be never fo deep, may not be able thoroughly to fatten him, but he will ftick there, or mend but very little ; for tho' a lean beaft will feed greedily till he is half fat, yet afterwards he will grow nice, and require to be tempted with fweeter meats ; otherwife he will not feed beyond hunger : therefore perfons ought to confider their land, and have a care how they refolve on fattening of cattle, becaufe they think they have plenty of grafs and a good bite.—Nor does it follow, becaufe French-grafs, hop-clover, or rye-grafs will fat, that therefore fuch graffes, when they grow on poor ground, will do the fame, tho' the cattle may have a full bite ; therefore fuch ground ought to be applied to the breeding of cattle.

Grafs, tho' plenty of it, from the poor land, not good to fat oxen.

FATTING of CATTLE.

Of fattening
cattle in
Jamaica.

§. 2. Dr. Sloan says, fol. 84.—The true way of fattening cattle, as I was informed by the graziers of Jamaica, is by bleeding them in the jugular vein, (which will stop of itself) and then purging them with aloes, or sempervive-leaves cleared of their outward skins.—Much the same method is often used by some graziers in the north, especially if their grounds raise a bullock very fast, as I suppose the land in Jamaica may do. Dr. Sloan says, the less nourishment the grass affords the bigger the paunches of the beasts that feed on it; so that the bellies of cattle, in dry times, in hot countries, are as big as if they were with young.—It would be the same with all sorts of cattle in England also, if you starved them.

Of fattening
a young
bull.

§. 3. I was saying to Mr. Bachelour of Ashmonsworth, that I approved of cutting a young bull before his being put to fattening; he seemed to wonder at it, and said, that he, and all the neighbourhood used to fat a young bull without gelding him, and they supposed, except he was not fatted till the next year, he would fat the better for it, and he was sure it was so of a ram, and to keep him till the year after would not pay charges.

Of fattening
a bullock.

§. 4. In fattening a bullock in Hampshire in the winter they use, by the latter end of October, when the goodness of the grass is gone, whereby he became half fat, to give him hay, and then to finish him with corn and hulls; but they ought to be wheat hulls; those are much the best; and it is much better to give him threshed corn than oats in the straw; for of them he will make great waste.

There is nothing cheaper, to raise a fattening-bullock with, than ground-barley mixed with chaff.

Of fattening
a heifer
with a
new-made
x.

§. 5. A Wiltshire grazier shewed me a three-year-old bull in January 1698, which he had gelt a fortnight before Michaelmas, and had then in fattening, along with a heifer; for, he said, they would fat more

FATTING of CATTLE,

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more kindly together, and it would very much improve their meat. His way was, to drive the new-made ox and the heifer to house on nights, and there give them their supper, and in the morning their breakfast, and then let them out to fodder with the milch-cattle; for keeping them warm in the cold nights did much favour their fattening.

§. 6. About the beginning of November, when it may be supposed the graziers have disposed of many of their high-fat oxen, and the plough-man has sowed his crop of wheat, and casts off oxen, then will the markets be open for lean oxen, which the graziers buy to eat up the * oughts, and rowety ^{Time of buying in lean beasts.} * leaving. ^{grass the high fat oxen had left; and then with straw or hay they keep them in a thriving condition till spring, when they begin to fat them; but from the beginning of November to the middle of December is the chief time of selling them.}

§. 7. A stalled ox in the winter, if he be kept to hay only, will eat at least a load every two months. ^{Quantity of hay a stalled ox will eat.}

§. 8. I asked Mr. Biffy how long an ox would take to be fat; he said, a good ox must be in good case at May-day, when he is put to grass to be fat. ^{How long an ox is in fattening.} If he is designed to be got fat by Allhallow-tide, which is about six weeks before Christmas; nor will he be fat then with outsome hay: but, if any grazier should order his grazing so, as not to get his oxen fat by that time, but must be haying all the winter,—unless beef be at three-pence halfpenny or four-pence per pound, he can get nothing by it.—I asked him how then it came to pass that we had any ox-beef in the markets at the latter end of winter; he said, some people were no wiser; but there were often beasts put to fattening, that would not be fat so soon as others, and some people overstand their markets by setting themselves a price, under which they will not sell, hoping beef will be dearer, and at last are forced to sell; then there are

cows that come in with-calf unseasonably, and they must be fattened, be it when it will.

Of fattening
a heifer
that has
not been
bullied.

§. 9. Farmer Lavington of Wiltshire says, that a heifer, that has never been bullied, will not take fattening so well as if she had; but if she has had a calf, or has warped, she will fat very well, though not bullied, when she was turned to fattening.—But Mr. Clerk of Leicestershire says, it is not safe to trust to her fattening without having her bullied.

How soon a
calf will be
beef.

§. 10. I asked Mr. Clerk how soon a calf would make beef; he said, a cow-calf would make very pretty beef at three years old, but, if killed sooner, they called it beviss; nor would an heifer prove in fat till that time, not being past growing; for which reason steers will not be beef till four or five years old, because they will be so long growing; therefore it is only profitable for those countries to fat steers that plough them.

The sooner
a cow
goes to the
bull the
sooner her
milk dries
—therefore
to be fat-
tened.

§. 11. I had an old black cow brought a calf in the beginning of July, the cow being high in calf: the question was, whether I should keep her over the winter, for sake of her winter's-milk, she having calved late in summer, or should make the best I could of fattening her, she being in calf. So I asked the farmer's wife, if such a cow, being old, would give milk all the winter; she replied, according as she should take bull; the sooner she took bull so much sooner her milk would dry up.—Now she, being high in calf, would soon take bull; so I looked on myself as answered.

§. 12. An old cow, or an old sheep, will not fat near so well with hay as with grafs.

Ground-
oats or
barley to
fat an old
beast.

Mr. Clerk of Leicestershire said, he commonly gave a bull, or an old beast, when they were got pretty well in flesh, (if corn was cheap) ground-oats and ground-barley; he said, it would improve them much; he gave it them dry, and it would make them drink abundantly.

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Mr. Putchin, and Mr. Oldershaw of the same county assured me, they knew of nothing so good to plim a horse, or an old cow, as the tails of the malt, or the larger malt-dust; the proportion was, to boil two quarts of malt-tails in six or eight quarts of water, and to give it two or three times a day:—it would, they said, fat an old cow in six weeks time, so that she would feel very well to the butcher, but then, said they, she would deceive him; for it cannot be expected that flesh blown up so soon should carry any quantity of tallow withinside.

§. 13. Falling into company with an ancient butcher, I asked him, what ground he judged best for giving tallow to a beast. He said, old grass-ground, if fat, though lying high and dry, would do very well towards Midsummer, but it would then fall off, at which time the lower and moister pastures would tallow much better: he said, such pastures were good for tallowing all the year round.

§. 14. It has been found by experience, that turnips do not fat cattle well after Christmas; they grow hollow and sticky; but they will do very well for folding sheep.

§. 15. A butcher came to buy an old cow of me; she was near fat: it was October the 13th, anno 1702; he said, if he bought her, he would keep her till Christmas in aftermas-grass, for my broad-clover would raise her no higher. —I said, I thought so too; for the broad-clover leaf, being so very broad, held a dew on it, at this time of the year, all day long, whereby the cattle fed half on water; besides, the juice of that grass was too watery at this season; but the meadow-aftermas is soon rid of the dew, within three hours of the morning, and does not hold it like broad-clover. This I learned by having occasion to carry some aftermas broad-clover hay to dry, and to spread it abroad, which I found was to no purpose on a broad-clover ground;

FATTING of CATTLE.

and yet I did it with good success on the rye-grass, though of a deeper bite than the broad-clover.—A farmer of my neighbourhood coming afterwards, asked the above butcher's father, whether it was best to fat a cow in broad-clover or meadow-erfhe at this time of the year. The old man said, the meadow-aftermafs was abundantly the better, and gave my reason for it, without knowing what had passed between his son and me.

Hop and broad-clover hay not good to fat large cattle. See Grasses, § 16.

§ 16. Farmer Sartain said, he had experienced, that hop-clover and broad-clover hay would not prove a bullock in fattening;—But quære, whether this may not only hold good in the great oxen of Wiltshire.—Surely small beasts, such as are in our hilly-country, may do very well with those sorts of hay.

Meadow-aftermafs best.

§. 17. I asked Mr. Bissy what aftermafs would raise a beast in autumn so as to finish him; he said, in the spring almost any ground will raise a bullock, the sap being then flush; but it must be the aftermafs of good ground only, when September and October come, that will hold a bullock, and carry him on when near fat; for though, by hayning up a ground early, after mowing or summer-feeding, there may seem to be a great bite of grass in it, yet, if such ground, by reason of it's poverty, should fall off of it's strength in September and October, which may be seen by the dying away, or the fading colour of the grass, it is lost on such a bullock.

If one has natural aftermafs-grass able to keep up a bullock from September to Christmas, it will pay for keeping an almost fat bullock or cow, if she be not too forward with calf; and the reason is, because there is but a small part of England that have natural aftermafs at that time of the year, fit to fat with, in proportion to the summer-clover every one has fit for that purpose; besides ox-beef is not then come in, and cows are generally too forward with calf.

§. 18. I

FATTING of CATTLE.

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§. 18. I asked Mr. Bissy if French-grass hay was fit to fat a bullock with; he said, the Somersetshire graziers going to London had often assured him, that, if French-grass was cut early in flower, it would fat cattle very well till towards spring, but then it grew too dry.

Of French-grass hay to fat a bullock.

§. 19. By discoursing with Mr. Bissy about winter-fattening, I find by his experience, and the neighbourhood's, who have kept the account, and weighed the hay, that a good heifer put up to winter-fattening on hay would eat at least two hundred weight of hay per week, which at thirty shillings per ton, or eighteen-pence per hundred weight, will come to three shillings per week, and at that rate her fattening for twenty weeks will cost three pounds, and in less time a heifer, that is not very forward when put up to hay, cannot be fatted; yet at this rate, if beef sells well in the spring, some advantage may be had, but gain cannot be depended on by such practice.—How comes it then, said I, to pass, that heifer-beef is so frequently to be had in the spring? Because, said he, we graziers have sometimes the mischance to have a heifer warp, that would otherwise have been beef at Christmas, but casting her calf put her at least ten weeks backward, and, to make the best of her, we must keep her on to fattening. Sometimes we are disappointed by a heifer's or a cow's calving sooner than we expected, perhaps in December or January, and thence she would go dry; such we must therefore fat, and, being fed with hay, she makes early beef in the spring.

What quantity of hay will fat an heifer.

§. 20. Fourteen pound weight of hay is the constant allowance on the road, to every fat beast that is drove to London; they that entertain cattle fling fourteen pound of hay for each beast into the rack in the evening, when they come into the inn, which is to serve also next morning for their breakfast; so that half a tod, i. e. seven pound of hay, is supposed sufficient

Allowance of hay to a fat beast on the road.

sufficient for a fat ox's bait at night, and the same in the morning.

Of beasts
that are
over-drove.

§. 21. The cattle, that in hot weather come to London in droves, are many of them heart-broken, and so heated, and tired off their spirits, that, if they were not killed they would die; and those whose feet bear not the journey well, do so waste their juices through the fatigue, that, when they are killed, they will not stiffen.—The reason is, because they have so emptied themselves of their juices that their joints will remain loose and flabby; — and thus we may observe, the plimming of meat in boiling argues the youth of it, i. e. it's fulness of juice, and it's shrinking argues the contrary.

Cattle handle best
when
warm, &c.

§. 22. Mr. Clerk, Sir Ambrose Phillipps's tenant, says, when he drives cattle to Smithfield, if he has a chapman that is eager, as soon as his cattle take up their stand, if he can he will deal with him; for cattle handle to the best advantage when warm, and their fat when heated is mellow, and softer, than after they have stood to cool.

One may be more deceived in the condition of a fat beast in good quick-springing grass than in a coarse pasture, because the fine grass may plim him faster than it can make good sound meat of his flesh.

Of old
cow-beef.

§. 23. An experienced butcher observed to me, that a young beast would eat well half fat, but an old cow, and but half fat, was not eatable; for the whole body of such a cow ought to be filled with new juices.

Old cow-beef generally comes in about St. Simon and Jude, which is the latter end of October, or later; for old cows are not apt to take bull so soon as young ones, and so do not make the earliest cow-beef.

Old cows
tallow best
on the in-
side.

§. 24. The butcher killed a fat cow for me, of four years old; I saw her opened, and she proved very fat withinside, and very fat on the back. — He said,

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said, it was common for a young cow to be fat on the back, but very rarely to tallow well in the inside; but old cows generally tallowed best withinside, but not so well on the back.

§. 25. If a cow seeming high in case should bring forth a small calf, it argues, the cow thrives in tallow; and if a good cow, sniddling in case, produces a great calf, there cannot at that time be any foundation for tallow. Sign of a cow's tallowing well.

§. 26. I was at Gausuns in Wiltshire with farmer Pain and Mr. Bissy: they agreed that an old cow, though she would not weigh so well in the quarters as a young one, yet she would tallow better. — But farmer Pain said, to his certain knowledge, an old ewe would not do so; what tallow an old weather might yield he knew not. — However he was sure, that the best mutton, and that for which the butcher would give me most, was a sheep of two year, or two year and a half old; such mutton would spend and weigh best. I objected, that such sheep, not having done growing, would not be fat. He said, he never found it so: he bade me look at the ewes with their lambs, that he then had with him; the ewes are but two years old, and I hope, said he, to have them all with the butcher in a little time. Old cows tallow best.

§. 27. In discourse with farmer William Sartain of Wiltshire about the choice of a bullock for fattening, and when his bones lay well, he said, an understanding butcher might get more money by an ugly mishapen bullock than one whose bones lay well, because those bones that lie ill, carry more fat than they seem to do; therefore, if a bullock handles well in the places they make trial of, that is only to be regarded. Marks of a good bullock for fattening.

§ 28. If a cow carries a deep navel, or her navel springs or struts forth when she is fat, it is a very good, and almost a certain sign that she will die well, that is, that she is full of tallow. Signs of a cow's tallowing well.

If

FATTING of CATTLE.

Id. of an
ox.

If an ox be full at the cod, when bought lean, or springs and struts forth full in the cod, when fat, it is a good sign that he will tallow well.

Marks of a
good ox—
among the
antients.

§. 29. * Varro, Columella, and Palladius are, in the main, pretty well agreed in the characters they have given us of a fine ox, which are as follow — Symmetry of parts; stout sound limbs; a body large and somewhat long (close and short, says Columella) and well ribbed; horns bending a little inward like a crescent, stately, strong, and in colour inclining to black; a broad curled forehead; large black eyes; great hairy ears (or, as Markham translates it, rough within); flat cheeks; spreading nostrils; snub nose; blackish lips; neck thick, long, and muscular, with vast dewlaps, swagging down almost to the knees; deep brisket; buttocks round and full; sides and paunch strutting and capacious; a strait flat back, or a little swayed; a tail brushing his heels, the lower part of it thick with hair, and a little frizzled; nervous and well set his legs, and

* *Hæ pecudes sint bene compositæ, integris membris (grandibus, Colum.) oblongæ, amplæ, (corpore denso brevique, Colum.) nigrantibus cornibus (proceris et robustis, Colum. sine curvaturæ pravitate lunatis, Pallad.) latis frontibus (et crispis, Colum.) oculis magnis et nigris, pilosis auribus (hirtis, Colum. magnis, Pallad.) compressis malis, submissisve, apertis naribus, labris subnigris, cervicibus crassis, et longis, (et torosis, Colum.) a collo palearibus demissis (amplis, et pene ad genua, Colum.) latis humeris (vastis, pectore magno, Colum.) bonis clunibus (rotundis, Colum.) (capaci et tanquam implente utero, lateribus porrectis, dorso recto planoque, vel etiam subfidente, Colum.) caudam ut habeant profusam usque ad calces, inferiorem partem frequentibus pilis subcrispam, cruribus (nervosis, Pallad. brevioribus potius quam longis, Colum.) rectis genibus, eminulis, distantibus inter se, pedibus non latis (ungulis magnis, Colum. et Pallad.) neque ingredientibus qui displodantur, nec cujus ungulæ divaricent, et cujus ungues sint pares,—et leves, says Varro, but that term must rather refer to the cow than the ox.—Corium tactu non asperum et durum, colore potissimum nigro, dein rubeo, tercio helvo, quarto albo; mollissimus enim hic, ut durissimus primus.*

rather

rather short than long; his knees strait, somewhat knotted, or embossed, and standing wide from each other; a foot not very broad, the claws large and of an equal size, not standing apart, nor liable to accidents by inclining inward; his hide smooth and sleek to the touch, it's colour black, as the most eligible, because it denotes the beast to be of the hardiest kind, next to that red, then flesh-colour, and lastly white, which is the tenderest of the four. The colours Columella and Palladius most approve of are red and brown.

A beast should have a large hoof or foot, and large long legs: this is a sign, that, when he is fat, he will weigh well. A spiny-legged beast never pays the grazier so well as the former.

Id. for fattening among the moderns.

A beast should not be leather-throated, that is, have his skin hang down deep under his throat; but should have a thin neck: the former is observed never to prove so well.

A beast should be deep in his gascoigns, which mounts him high in the hinder parts, and makes him weigh well.

A beast should be wide between both huckle bones, which gives room for his filling: such a beast, when fat, will be sure to weigh well.

A beast should be deep in the brisket, that is, from the upper part of the shoulder to the lower part of the neck; for then he will fill well with fat.

A beast should be short ribbed, that is, the rib and the flank should meet close: some beasts either want a rib, or have a false rib, which is so called, because it is very little, or lies deep within; this is a great dislight, by which means the flank will pitch and fall in.

When a beast is fat, he will shew himself to the eye to be so by a roll of fat as big as one's fist, which when he walks, moves itself forwards before his shoulder:

FATTING of CATTLE.

shoulder : such a roll of fat may likewise be seen in his flank. *Luxuriat toris*, says Virgil.

Sign of a
good cow.
See Bulls
and Cows,
§. 1. &c.

§. 30. A cow has a good udder, when her teats are at equal distance, and pretty wide asunder ; when the teats are near together, there is danger of losing one of them ; as her teats ought not to be very small, so neither ought they to be too big ; for such are called windy teats.—When a cow's udder hangs full in leather, and in wrinkles behind, it is an argument the vessel is large to receive milk, whereas some cows, tho' they might give ever so much milk, have no vessel for it.

Mr. Clerk of Leicestershire says, after all that has been said, if he can buy a cow cheap, he will buy her against the rules and shape above described, and she may sometimes pay as well as any.

Signs of a
good beast.

§. 31. Being at Holt in Wilts, I fell into discourse with Mr. Biffy, and having a mind to be more particularly informed in this branch of the grazier's business, I asked him what were the signs and tokens of a good beast ; those by which he chose them when he went to fairs ; for he had just been saying, that there were many beasts in a fair, which were in show twenty shillings better than some others, and yet not so valuable as those that seemed to be so much less worth : nay, he said, there were many fat beasts in Smithfield-market, twenty shillings more in weight than some others, and of the same age too, and the lighter beast the more preferable at the same price.—He therefore said, that, in an ox the experienced graziers had a particular regard not to buy one that had a long and heavy dew-lap, or merry-thought, which hung down under his throat, nor one that had a thick jaw, nor heavy small eyes, nor that was thin in the buttocks : they commonly observed, he said, that those beasts, which had most of these properties, paid least for their
their

FATTING of CATTLE.

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their fattening, nor did they take it kindly ; for they were apt not to take fat in all parts proportionably alike. — We love to choose those beasts which have not too thick a hide, but of a middling thickness ; for the grain of the beef of a thick-hided ox is apt to be coarse, and yet we do not covet a very thin hide neither. — The north-country oxen, said he, are generally thick-hided, nor will they in Smithfield sell so dear as North-Wiltshire oxen will do : the sweetness of our beef is esteemed greater than their's, and we can out-sell them one hundred weight in seven. — We choose an ox with a light head, thin and close jaws, full and lively eyes, not thin on the rump, but that has a thin and short dewlap, and as little under the throat as may be ; such an ox is likely to thrive much faster than one of the contrary shape, and to carry fat in all pieces equally, which is a great advantage to the butcher ; for then, the coarse pieces will sell well. A light bony head in a sheep is also a good sign, but in a cow a long and heavy dewlap is not so much regarded. — Then I went with him down to his grounds, and was shewed two oxen which answered the above differences and characters. — Taking notice of a particular ox, he said, he was half fat, and began to gather flesh, which might be as soon perceived in the cod as any where ; for there they soon begin to shew their thriving, and so does a weather-sheep. — I observed myself the cod to be trufs, and extended round as big as my fist ; whereas, in the lean oxen in the field, the cod was lank, and made little shew. — He says, all fat beasts are apt to be too hot ; therefore a fattening-bullock, if he be kept out of the wet, cannot be kept too cool, and for that reason it does very well for one side of the fattening-houses to be open ; for, if a fattening-bullock be too hot, he will be apt to * peal : but for lean beasts, they could not be kept too warm.

* the hair
will come
off.

Also of a
worked and
unworked
ox.

§. 32. I find by Mr. Alyff of Oxenleaze, Wilts, that the largeness of the cod of a fat ox is a great beauty, and the bigger it is, proportionably a sign of his fattening the better; and he is very positive in it, that oxen that work make the best beef, and die kindlier, and are inwardly fatter than those that never worked, and says, (it being a phrase he often used) that they divide better in the joints, and piece better under the cleaver, when quartered-out by the butcher; whereas the unworked-beef does not so easily divide, and (as he terms it) eats coarse and livery.—I told him, I had often heard the graziers affirm as much, but it did not seem reasonable to me, because, as country farmers and labourers had much greater strength than gentlemen of the same bulk, by means or the exercise of all the ligatures and cords of their bodies, which became thereby stronger and tougher, so I thought that must be the case of the ploughed ox; and seeing their flesh and ours is but a bundle of pipes, tubes, or fistular parts faggotted together; full of heterogeneous juices, I could not consequently suppose, but the flesh of a worked ox must be tougher than the flesh of an unworked ox.

Marks of a
beast when
fat, or for
fattening.

§. 33. Markham, lib. 1. fol. 62.—for an ox to feed, advises, that he should as much as might be, be ever lusty and young of years, or, if old, yet healthful and unbruised, which you may know by a good tail, and a good pissel; for, if the hair of one or both be lost, he is then a waster, and will be long in feeding. If you would choose a fat beast, handle his hindmost rib, and, if it be loose, and soft, like down, then it shews the ox to be outwardly well fed; so do soft huckle-bones and a big notch round and knotty; if his cod be big and full, it shews he is well tallowed, and so doth the crop behind the shoulders.

Mr.

FATTING of CATTLE.

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Mr. Serjeant Webb's bailiff came to me in the beginning of November, 1713, to buy my lean oxen, that I wanted to cast off to the grazier. He found fault with some that their bones did not lie right in two respects, viz. that they were thin in their buttocks behind, i. e. that their buttock, or britch-bone did not spread, and stand out wide; from whence, he said, they would not prove, nor fill up in their buttocks behind, so as to look well to the grazier.

Again, there were two of them that had a rib wanting on each side, or a rib less in the flank than they should have, viz. the first rib next to the buttock: note, though this defect commonly goes, and is known by the expression of a rib wanting, yet a juster expression is, that such a beast has a short rib, which sinks or falls inward, and does not bear outward, as the rest do, so that in the handling one cannot get to feel all of it; but the lower part seems lost, and therefore it vulgarly carries the name of a lost rib.

There was another bullock he excepted against, because the bottom bushy part of his tail was lost, having but little hair on it, which was to him a token that he had been over-worked.

In two or three he disliked their hair's staring, or standing on-end, on the ridge of their back, another argument of their hard labour.

I asked Mr. Dark; a great grazier in Wiltshire, what marks he looked on as promising in beasts to be bought for fattening; he said, a beast with thick horns was by no means liked by graziers: and a thick head was an ill mark amongst them; a beast with large ribs weighed well; a close-ribbed beast, with quarters that lay well, they liked to buy, and not a thin flat-ribbed beast.

§. 34. A butcher bought a heifer half fat of me to kill: he said, she would not pay for keeping, for

A thick
hide a bad
sign.

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the was thick-hided, and such beasts would not prove.—I observed the hide seemed to sit loose, and the hair to stare more than ordinary, or look like beggars-plush.

Upon the best inquiry I could make of Mr Biffy, farmer William Sartain, and others in Wiltshire, they do not think the Welch-cattle of North-Wales and the cattle of Shropshire fat kindly ; for they are thick-hided, especially the burs, i. e. the oxen ; — and it is to be noted, that the thicker hided the cattle are the longer they are in fattening.—And it is generally to be observed, that the cattle of North-Wales are black cattle.—But Mr. Biffy says, that in South-Wales, as in Glamorganshire, they have thin-hided cattle, which are much on the red and brown colour, and that they get their breed from Gloucestershire ; they will fat very kindly.—Mr. Biffy tells me, the more northerly the cattle are bred, by means of the cold, the thicker are their hides ; for in Leicestershire, Derbyshire, and Yorkshire, the hide of a large ox may sell for thirty shillings, because of it's thickness, and being fit to make ben-leather for the soles of shoes ; whereas the hide of an ox in North-Wiltshire, &c. though as big as the other, will not fetch above fifteen shillings ; but such an ox will notwithstanding sell for more than a north-country ox will do, because the meat is finer, and the beast will yield more tallow ; for the finer the hide the finer always the meat.—I put the question to farmer William Sartain, young John Sartain, &c. —what difference there might be in Smithfield-market between the price of a north-country ox, and a North-Wiltshire ox of the same weight ; they said two pounds in ten pounds, but the hide of the north-country ox would yield a third penny more in value.

Rules for
the hill-
country
grazier.

§. 35. If a farmer intends to graze cattle in a hill-country farm, such as mine in Hampshire may be, these

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these three things are especially to be regarded ; First, to raise a good quantity of French-grass for hay and aftermafs.—Secondly, to turn a good quantity of hill-country meadow into rich pasture, by feeding it, dunging it, or other manure ; to make it fit for raising the bullock or heifer in the spring, when he comes first from hay into grass-leaf, and to receive him with a vigorous aftermafs, when other grasses, as clovers, and French-grass aftermafs goes off.—Thirdly, to have hovels in your bartons, inclosed with close court walls, to shelter your cattle in the winter from wind and rain. All these three things are necessary and uniform, and do correspond one with another ; without them grazing must be carried on very defectively, and to little profit by the hill-country farmer.

By the methods here prescribed, in order to the fattening of cattle, plenty of French-grass hay will enable the grazier to buy in barren beasts before the spring-grass comes, when it is most likely they will be cheap, and may be bought to the best advantage, allowing the value of the hay they may eat in consideration with the purchase ; and if by winter-hayning some meadow-ground, (after it has been fed close, but has been kept high in heart, by feeding it and soiling it,) you can early in the spring, by April or sooner, have a bite to take off such grazing beasts from hay to grass, it will be very advantageous before the clovers can be ready, which are seldom so in the hill-country till a week or fortnight within May ;—and by hayning-up such meads for an aftermafs, which towards the end of the summer are in very good heart, you'll support your bullock, and carry him on when the spirit of the other grasses fail.—Then such cattle as are unfinished being brought to French-grass hay, and tied up under hovels, or coverings, and within court walls, will proceed in thriving by being secured from the wind and rain,

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and the tedious hill-country rimes, that often continue whole winter-days, all which makes fatting-cattle brought from grafs to pitch, and washes them out.---Besides, if you have not plenty of French-grafs hay, you cannot in winter make the best of a milch-cow that warps, or of a cow that towards the latter end of winter you may perceive proves barren, or of a fat cow that casts her calf before you kill her.

—I mention here the necessity of French-grafs hay only, and not of clover hay, because I suppose the hill-country farmer, who provides store of French-grafs hay, will be wise enough not to mow the clovers, but to feed them, to improve his lands, for the hill-country farmers have generally so much land for their money, that all they can do is little enough to keep their arable land in such heart, as for their profit it ought to be in.

If the foregoing cautions are not observed, the ill consequences that will follow must be such as these ; —if the first of the three foregoing cautions is disregarded, your cattle cannot at any time of the year be made fat as they ought to be, and then you must be under necessity of selling them half fat, of which necessity the buyer never fails to take the advantage; and sell them you must, notwithstanding the prospect of prices rising in a month or two never so much; and you'll commonly find, that you shall have nothing for the meat they have eat whilst they have been fatting. —In the second place, we will suppose that very few will be so unwise, as to begin to fat a beast in October with hay, and so to hay him throughout the winter; but we may reasonably suppose, that warping beasts and barren heifers, &c. may, and commonly are begun to be fatted with hay from Christmas, in which case, though hay be plenty, yet if an early spring-grafs be wanting, such cattle must be hayed at least till the middle of May; for till then, in the hill-country, the clovers will not give

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give a beast a bite, and then commonly, where the master is at a loss and disappointed, the goods suffer before his eyes before he can make the best of them, and in this case he shall find a beast visibly pitch before he can find a purchaser for him.—Again, if early spring-grass be wanting, you cannot begin summer-fattening of cattle, nor can buy a barren heifer till towards the middle of May, and then they are commonly very dear; and in the hill-country from so late a beginning the summer-grass will hardly fat a beast, the ground falling early off its strength, being generally poor;—and then, if you have not a quick-growing after-mast treasured up, by keeping such ground as was formerly meadow in good heart for that purpose, it is plain you must again run into the first evil;—and if you have such an after-mast, you will again often be wanting hay in November, and December, to finish summer-fatted beasts; so that plenty of hay is always necessary, &c.—And lastly, though you have both hay and grass, if you want winter shelter the cattle must suffer.

PROPOSALS for FATTING CATTLE in the hill-country, and first of the BARREN HEIFER.

§. 36. It is proposed (1.) That the meadows of the farm, which generally in a farm of an hundred pounds per annum hold to no greater proportion than from twelve to twenty acres, be laid to pasture for the fattening purpose.

(2.) That from seven to ten acres be yearly sowed to hop-clover, for the first spring-grass for the fattening of beasts.

(3.) That the good pasture you have made of ground best inclined to natural grass, by chalking and dunging, &c. may receive the barren heifers, (for I fear it will not be good enough, nor deep

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enough fed for the oxen) and this made pasture, having been hayned from the latter end of January, or the middle of February, I suppose may by the end of April have got a good head of grafs.

(4.) Your barren heifers must, from the time they may have been supposed to have eaten up this made pasture, be kept in your meadows till they come to the slaughter.

All fattening-cattle, whether lambs, sheep, barren cows, or oxen, do require a regular and proportionable progression from coarser to better food, as they grow more and more into good flesh; otherwise, when half fat, they will go back, and you will not without great difficulty raise them again, which will be a great loss, nor will such beef spend kindly.

Against the time he buys in his heifers, a gentleman who would make a good hill-country grazier (for I do not suppose it to answer but to such who kill their own beef in their family) ought to take care to be provided with an over-plus stock of middling good hay, or of winter-vetches, or of barley-straw and autumn-grafs mixed together, layer and layer of each, be it whatever it will; it ought properly to be better than barley-straw; for he is to suppose he has bought barren heifers which have been kept all winter to straw;—if they have been kept better, i. e. to straw and rowet, there is still the greater reason for him to mend their keeping;—and he is from the time of buying to consider, that he ought to begin to raise them in flesh; for the better case they are in against they are turned to spring-grafs, they will take to fattening the kindlier, and bear their first scouring the better.—If he could turn them into a field, for an hour or two in the day, where there is a little rowet, it would do well, and to have change of the abovesaid dry meats would keep them the better to their stomachs.

PROPOSALS for FATTING OXEN, in the hill-country.

§. 37. The times of turning off oxen to fattening are two in the year, which in several respects answer the publick conveniency, viz.

(1.) The first is about May-day, when the labour of the ox is pretty well over for the spring-season, the spring-corn being then generally all sown.

(2.) The second time for turning oxen to fattening is the beginning of winter, i. e. from the first of October to the middle of November, which falls out again very luckily; for then the winter-corn, i. e. wheat, and winter-vetches, are generally all sowed throughout England, and the plough-man's hurry relaxes.

At both these times the grazing gentleman, who designs to kill for his table all the year round, must turn oxen to fattening.—We will first begin to discourse of the spring-fattening, which is the most chargeable to the husbandman, [and therefore he ought to expect a better price; and a suitable return;] for oxen turned out at May-day will hardly get fat till Christmas, and, if not turned out till June, will not be fat till March, April, or May, which again falls out very opportunely; because from Christmas till the latter end of May cow-beef is very scarce, and is generally supplied by ox-beef; but then it is obvious, that when an ox gets half, or three quarters fat by or before winter, he must be supported and carried on by a great quantity of hay, and that very good; for the beast will then grow nice.

The other time of entering an ox into fattening is, as before said, in October and November, when he is also turned off from the plough; and the gentleman, my young husbandman, must be informed, that it is

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waste to lay very good, much more the best of hay before such an ox; for coming hungry and poor to it, he will devour abundance, and will eat up the fattest hay without paying for the cost and charges of it.—The most you can propose by this method is to get him fat by July, instead of September, or October; during all which interval of time heifer-beef will be plenty, and will sink the price of ox-beef; therefore so chargeable a method will not quit costs.

What the grazier therefore in this case ought to do, is as follows: he should bring his ox easily and gently into good flesh by a rowet, that he ought to have hayned his grounds up to for that purpose, and of which rowet he ought to give him the worst first, except it be of so sour a kind as to want the correction of the winter-frosts before he will eat it, of which kind stubble-rowet commonly is, and in such case that must be reserved till then, or rather for young beasts, and milch-cow cattle.—He ought to give him variety of dry meat along with his rowet, in which he ought to consult his tooth by flinging before him, by changes, each sort of good straw, giving now and then a lock of winter-vetches, or coarse hay, but of every thing good in it's kind, i. e. sweet, and well made, and thus the ox ought to be carried on throughout the winter.—Against March comes he ought to have better hay; not only because the rowet may be supposed to be all gone, but also because the ox mending in flesh grows nicer, and will be weary of dry meat, through the tediousness of being foddered so much with it during the winter; therefore his hay must be mended; for not proceeding is going back.—Against April, if possible, a short head of grass should be got for him in your pasture-grounds for cow cattle, by hayning the pasture in February, that he may have grass along with his hay, as before said in the fattening of barren heifers;

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heifers;—and against May a head of hop-clover must be in readiness, in the hill-country, to receive him into his first full grazing, as is also said of fattening the barren heifer; for it is not to be supposed the meadows of the hill-country, which according to this scheme are to be converted to pasture, can be fit before the first of June to entertain a grazing-ox; and it is also to be noted, that in the hill-country, in the month of May, hop-clover will not afford a good bite for an ox, or a cow, unless the autumn-bud be hayned, and preserved from being fed by sheep: in the month of May, if it should prove a cold and dry spring, the fattening-oxen and cows must also with their hop-clover, if it be short, have good hay given them, if they will eat it.—Note, fattening in the hill-country, if you hay in the winter, is more chargeable than in the vale, not only because hay is dearer there, but also because the winter-season begins a month sooner, and holds a month later in the hill-country than in the vale.

Thus you see what disadvantages the hill-country gentleman lies under, who would kill a bullock once a month, or three weeks, more than a grazier of the vale does; for the first must, in a manner, by forcing nature, provide rowet and several sorts of grasses in their due order, exactly accommodated to the season of the year, besides winter-meat, &c.—Whereas, for the latter all may be procured in a natural course, with but a very little care and trouble.

Now I doubt not but by this time the reader is provided with a fatal objection, and will tell me, I have forgot the taking care to provide one of the most material and difficult ingredients to be had in the hill-country for fattening of cattle, viz. proper grass, in a sufficient plenty, and yet on all occasions I have before prescribed it.—I do acknowledge I should

should make a very great, and ridiculous blunder, without an ample provision in this case; I must therefore lay it down as a principle, that a hill-country grazier goes to work without his tools, who does not lay down from fifty to an hundred acres of land proper for it to French-grass, not only on the account of making up the deficiency of the meadows, not laid down to pasture, being converted to other uses, but also to answer many other demands; for instructions in which matter, I refer to the chapter on French-grasses, &c. ^b

T U R N I P S.

Liming
good for
turnips.

§. 1. ^c **O**bserving that the turnips, which one of my tenants was cutting, were wormy, I told him, they would have been less so, in case he had limed his ground. — He said, that last year (1702) he limed one part of his ground, and those turnips were much freer from worms than these; — and, said I, much sweeter too, I believed. — He answered, he never had sweeter turnips, nor carrots, than from that ground, and he did believe that liming was the occasion of it.

Dunging
turnips in
Norfolk.

§. 2. ^d Mr. Heron of Norfolk assures me, that they dung their turnip-land as much as may be, even to that degree, that their dry-land meadows are quite impoverished by it.

^b See the articles—Bulls and Oxen—Cows and Calves.

^c To destroy the caterpillar, Mr. Miller says the surest method is, to turn a large parcel of poultry into the field; which should be kept hungry, and turned early in the morning into the field: these fowls will soon devour the insects, and clear the field.

^d Dung and tillage together, says Mr Tull, will attain the necessary degree of pulverization in less time than ploughing can do alone; therefore dung is more useful to turnips, because they have commonly less time to grow than other plants.

§. 3. I had discourse with Mr. Pawlet of Leicestershire, who deals in great quantities of turnips; it was August the 7th, 1699—he says, when turnips are sowed after Midsummer they are generally counted out of danger of the fly:—This fly is like to a weevil breeding in malt, with hard wings; there is no danger of it after the turnip-leaf begins to grow rough, which will be in a fortnight's time after sowed, if they come up well. He sows a pound and half of seed on an acre, and so, as I find, do all the gardeners in those parts; for the more are sown on an acre the more chance they have to escape the flies. — There are, he says, four sorts of turnips; viz. the white turnips, the red or blue turnips, the yellow turnips, and the long turnips; for sale the gardeners deal only in the first two sorts;—that the fly lays more severely on the leaves of the red or blue sort than on the white; that turnips should be sowed in dry weather, or else they cannot be raked or harrowed in well; that they must have a shower of rain to come up in; that though it is true the rain beats downs and destroys the fly that would devour them, yet it makes those flies that out-live it cruelly hungry; so that it is after such rain that the turnip-leaves are most eaten. He says, there is so much moisture in the ground before Michaelmas, that you never need to doubt the seed sown in August or after.

4. §. Mr. Scamwell assures me, if I strew tobacco-dust over the land where any greens, as lettuce, &c, are set, (suppose a pound to an acre) the fly will not come to those greens. Quære, if not a good way to sow turnip-feed with tobacco-dust.—I am told if you mix powder-brimstone with your turnip-feed it will preserve them from the fly.—Mr. Worlidge in his treatise, called Two treatises, says, that the greatest

* Mr. Miller adds two sorts, viz.—the rusty-black, and the green turnip.

enemies to turnips are the flies, which, about the sowing-time, by the sun's influence, are generated in the stubble that remained in the field, where you now sow your seed ; for it is observed, that an easy ploughing and sudden sowing these seeds makes the turnips more apt to be thus destroyed, than a well dressing and more leisurely sowing ; for this deprives these vermin of their shelter and sustenance, so that they generally die before the seeds come up. The seeds being soaked in foot-water, and sowed, the bitterness they have attracted from the foot is said to be a security against birds, flies, and insects.—New-burn-beaked ground sowed with turnips has been observed to escape the fly more than other land, and some strew ashes on their turnips in gardens to preserve them from this insect.

Turnips to be sowed early in a cold country.

§. 5. Mr. Bachelour told me, that I might depend on it, this was so cold a country, that, if I sowed turnips the latter end of August, I should not so much as have leaves, and therefore I ought to sow them by Midsummer : he said, he had known it tried.

Why turnips sowed when the wind is northerly, or in a hot gloom, may not come up.

§. 6. I told a famous gardener, that I had heard it said, if turnips were sowed when the wind was in the north, or north-east, that no turnips would come up.—The cause of that, he said, must chiefly be, because such wind, which naturally parched the ground and dried up all moisture, was at that time accompanied with drought ; but he doubted not, though turnips were sown in such wind, if rain came afterwards, they would come up well.—I have also heard, said I, that if turnips were sowed in rain, and a hot gloom came afterwards, that no turnips would come up.—He said, the reason of that, he thought, must be, because the ground, by such a sudden heat after wet, was made starchy, so that the turnips could not get through ; and may not, said he, charlock, and other weeds be destroyed by the same accident ?—And indeed I cannot but agree with him ; for if it
be

be observed, you will find the turnip does not come up with it's seed-leaves, upright, picked, and sharp, as many seeds do, but with broad indented seed-leaves, and the stem that carries it's head being but tender, no wonder if it cannot pierce through the crust of earth, when it is hardened.—Here the wisdom of God is to be admired, who, having ordered seed-leaves not sharp-pointed or spiked, but broad, or many, and indented, and so not fit to force upwards, has caused them to bend their heads downwards, and so to get through the earth by their bended stalk.

§. 7. I am of opinion the way to have large turnips is to preserve some of the largest turnips for seed ; for from such seed do the largest turnips proceed ; whereas the seed bought of gardeners comes of their scattered seed, which, running up thick, does not head, nor produce a seed that will carry a large turnip.—It is the same of asparagus, says Quinteny.

§. 8. Mr. Chesslin of Leicestershire having been very successful in turnips, I asked him, whether he did not sow about a pound and an half on an acre ; he said, his was cold land, for which reason he sowed rather more.

§. 9. As the less solid the rinds of all seeds are the larger the fibres, and as the less spirit and oil is contained in them they do the less resist vegetation, and consequently putrefaction, and the sooner begin growing, or are malted in the ground, so such seeds may be expected, if they come not up in a few days (as turnip-seed in four or five days) to be either bursten with too much rain, or malted for want of moisture, and conveniency to set them on growing ; for such seeds, of the nature above described, are susceptible of a great deal of moisture, and therefore, when sown in the driest time, though they meet not with moisture enough to set them on growing, seldom fail of being malted, because the

very

T U R N I P S.

very relaxing quality which is in all earth, together with the dew of the night, are sufficient for that purpose. Yet, as to the bursting the vessels of the turnip-feed by plethory caused by too much rain, it may be noted, that some have observed a glut of rain to have fallen on the turnip-feed, soon after they have sown it, without any such ill effect, and others have found that such speedy rains have burst the vessels, and turned the flour of the seed into a mucilage. — In these two different cases, as I judge, the following distinctions should be made, viz. in case the turnip-feed be sown for the sake of roots in June or July, while the ground is hot with the sun, and has at the time of such heat been glutted with rain, or that a glut of rain immediately falls on such sowing the turnip-feed, i. e. the same day, or the night after it was sown; in such case I easily conceive, the turnip-feed being very susceptible of moisture, the seed-vessels may imbibe the rain to so great a degree as to be distended thereby, and be bursten with the heat that rarifies such moisture; — but in case the seed be not sown till about the middle or latter end of August, when it is sown chiefly for the herbage, the ground being generally cooler, and not heated like a hot-bed to force up the seed so quickly, yet moist enough, when driest at that time of the year, to set the turnip-feed on growing without rain, in such case, especially if rain does not fall under two days after the turnips are sown, it is probable the seed may have had so much time to swell gradually in the ground before the rain comes, that it may be past such danger; and this is the best account I can give of the aforesaid diversity.

Id. and of other seeds, As for the above reasons turnip-feed is subject either to be malted, or to corrupt, it may not be improper to add here, that the same reasons may hold for the same effect in many other seeds, as the medic-grass, the vetch, &c. — which the Rei rusticæ

the scriptores order to be soon covered, because they are soon corrupted ; for whether a hasty rain may come suddenly on them as they lie above ground before they can be harrowed-in, or they lie on the ground exposed to the scorching sun before they are covered, it seems in both cases, for the same reason, they may either be malted by the scorching heat of the day, and the giving damps of the night, or, being first scalded by the sun, and a sudden rain coming on them whilst above ground, they may imbibe the moisture the faster, and so burst with a plethora, and this more likely than if they were first covered, or than after they have lain wet in the ground, because, in the first case, the too much wet they receive as they lie above ground carrying not so much of spirit, or vegetable juices, or volatile salts of the earth along with the water, the nib, or germen is not so much impregnated therewith, as to be pushed forward into the act of vegetation, but the nib or plant of the seed is swelled, and drowned, and bursts in the vessels by receiving too much water without a spirit sufficient to actuate and protrude the vegetable parts, &c. — In the second case, the seed lying on the ground, if the scorching sun lies on it, its vessels, being thereby shrunk, do, on a hasty rain following, imbibe the moisture to a greater degree than otherwise, and to a bursting ; — and I must now acquaint the reader, it has not a little exercised my thoughts in the reflection what should be the reason why hop-clover and broad-clover seed should often come up so partially in the same field, where the nature of the earth has been the same, the season the same, and the tiliage the same ; yet I have had some lands in the same field, and that more than once, where the clover has not come up at all, or but sparingly, when at the same time it has come up in another part of the ground very prosperously. I am not able to account for it otherwise than that

I sus-

I suspect we have sometimes sowed some of the clover-seed, as is usual, after the day's-work of harrowing has been over, in order to cut out work for the horses the next day, and then rain has fallen in the night, or the next day, so as to hinder the harrowing the seed in for a day or two, or sun-shiny, or windy weather has come, so as to dry the seed, and we have neglected to heal it with the harrows next day, other business intervening, and so the seed has perished. I must confess I cannot advance this beyond a probable hypothesis for want of having kept a diary of the fact, therefore leave the reader to make the best he can of the hint I give.—

^f Pliny says, caution must be used in sowing the medic-clover, which ought to be covered in as soon as sowed, lest it should be burnt up.

Of sowing
turnips on
a peas-croft

§. 10. Farmer Miles says, he has often known, where peas have proved rank, so as to have made the ground mellow, that turnips have been sown thereon, as soon as the peas were removed, and harrowed-in without ploughing, and it has had very good success.

Of turnip-
seed lying a
year in the
ground.

§. 11. My gardener affirms, if turnip-seed be dropped, and in digging covered over with earth, he has the next year found such seed fresh and good; and, when the earth was turned back again, it has grown, and produced good turnips.—I asked him how that could be, since it is said, if turnips be sown, and no rain falls in some short time, the seed will die and never come up.—He said, that was true; for when it lies on the top of the earth, and but just harrowed-in, if nine or ten days hot weather come upon it, it will never come up, but in this it was turned a spade deeper under ground.

The time of
houghing.

§. 12. The Newtown-men, who houghed my turnips this year (1707) having made it their business

^f De medica cavendum, ne aduratur, terraque protinus integri debet. Plin. lib. 18. fo. 288.

for

for many years to hough turnips, assures me, that it is best to hough turnips as soon as they have four leaves, that is, as they explain it, the two seed-leaves, and the two succeeding leaves, provided they are grown big enough to be out of danger of being buried in houghing.

§. 13. In houghing turnips I suppose care ought to be taken to hough those up that are deepest rooted in the earth, and to leave those that grow upon, and most out of the earth, without much regarding their bigness, inasmuch as they that lie on the ground, and have room to grow, will quickly be the biggest turnips.

Manner of houghing turnips.

§. 14. A dry season is the best for houghing turnips, because neither the weeds nor the turnips houghed up will be so apt to grow again.

A dry season best for houghing turnips.

§. 15. I am apt to think the best way to manage turnips (the seed of which is impatient of growth, and apt to burst in too much wet, as also to corrupt, if the ground be so dry as only to give it a damp, but not wet enough to set it on growing) is, first to harrow the ground fine, then to roll it with a roller big enough to break the little clods, and so to let it lie till the next rain; then the ground being mellow, to sow the seed, and harrow it in with short-tined harrows, which may not open the ground too deep, nor bury the seed; then roll it again with an one-horse roller, in order to keep the moisture in the ground as deep as the seed may lie; for the surface of the ground must not be dried before the seed can strike root, which may be in two days and two nights, and yet the surface of the earth must be so fine, and so lightly compressed, that the seed may spear through.—The mystery of the success or miscarriage of a crop of turnips consists in these four things, viz. first in the seed's not lying too deep; secondly, in it's not lying too wet, which it cannot easily do if harrowed-in shallow, for the surface of the earth is soon

Best way of managing turnip seed.

dry; thirdly, in it's not lying too dry; and fourthly, in it's lying in a fine bed.

Id. in clay-
land.

Turnips ought, in clay-land, to be but just harrowed-in with a bush, as light as may be, that the turnip-root may grow upon the ground; for it will not be able to grow to it's dimensions within the clay-ground, or can it, if it be checked in it's growth by a stiff ground, be sweet, because, for want of room, the exuberancy of it's juice will make it knotty and sticky.

I have often considered the nature of turnips, particularly with relation to the soil of our hilly-country, and do think we are like to be deprived of that benefit others have from turnips, because our ground is so cold and backward in it's production, that we can never expect to sow a crop of turnips after a crop of hot-spur peas; for in the first place hot-spur peas will be late ripe with us, and, if we could rid that crop by the middle of June, yet that is too late to sow turnips with us, on account of the drought that reigns over us at that time, nor would turnips have time enough, in so cold a country as our's is, to grow to perfection.—If we sow in the beginning of May, the turnip will not seed with us the same summer; so that it is plain we cannot have two crops the same summer, but the crop of turnips, which is hazardous, must stand in the room of a crop of corn.—The best way I can propose for a crop of turnips in our country is, to winter-fallow the second or third year's clover-ground, which will be rather too poor to bear a crop of barley without the soil of folding, and then to sow turnips the beginning of May, and if they succeed, you will have all the May-showers to forward them, and time enough, if the first sowing fails, to try again, and, if you should not succeed at last, the ground will be very sufficiently, and excellently well husbanded to plough again, and sow winter-vetches in August: all things considered here is the least loss every way, as I could demonstrate.

§. 16. With

§. 16. With us at Crux-Easton, turnips will be sweeter in white than in our clay-ground, as I have observed in a garden-pot with one part of it clay-land, and the other white down-land : always from the white-land there comes a very sweet turnip, but from the clay-land a rank turnip that the people cannot eat;—I suppose, if a ground consisted of these two sorts of land, the sheep would lie on the turnips of the white-land.

White-land better than clay for turnips, in regard to their sweetness.

But notwithstanding this, January 10th (anno 1698) going to Holt by Burbage I asked a farmer whether white lightish land might not bear turnips, and he said, by no means, it was the worst sort of land of all for them ; the blackish sandy earth, or redish sandy earth were the best.—Another farmer I met with afterwards said the same, and they agreed the best time for sowing them was about St. James's-tide. [Note, if they are sowed earlier in the summer, the sun will ripen them, and bring them on so fast, that they will be apt to run to seed.] Charlock, rape, and turnip-seed are not easily distinguishable, and sheep will eat of the rape-roots as well as of the turnip-roots, and it is of the same nature, and the some sort of land agrees with it ; only the rape-root does not grow so large as the true turnip-root does ; yet many farmers about Burbage buy of it to sow.

White-land bad for turnips. Also of rape-roots.

§. 17. Mr. Cooper of Berkshire sowed four acres of turnips last summer (anno 1699) and ploughed them up at spring, and sowed the ground to peas ; and the little dwarfish turnips that were left behind uncasten, notwithstanding his ploughing them up, took root again, and were then in great quantities run to seed, and had much damaged his crop of peas ; but the seed being dropped he intended, after the peas were off, to harrow them in.

Turnips, if not clean eaten, may take root again after ploughing.

§. 18. Being in company with Mr. Gouch, a Norfolk gentleman, we discoursed about the turnip-husbandry of Norfolk : I could not find that they

Of the hanterry, a distemper among so turnips.

so much valued the harm the fly did to their turnips, while they were young and tender in the leaf, as they did a distemper or disease that fell on the roots of their turnips, which they called the hanbery, alluding it seems, as he said, to the like distemper in a horse's heel, which was a warty excrescence, that would sometimes grow to the bigness of one's fist, and that some years this distemper would take whole fields, and, after it began to grow in the turnips, they would never thrive.—No one, he said, could ever find out the cause of this disease.—I told him, I thought it must proceed from the egg of a worm or fly that was laid in the turnip, in the place where it had been bit, and the little maggot lay in the hollow place, which, with it's tail continually working circularly, formed the juice of the turnip into a round excrescence about itself, in which it continued growing, like that of the oak-apple *.

GRASSES.

* After blaming the practice of putting a flock of sheep into a large ground of turnips without dividing it, by which they will destroy as many in a fortnight as would keep them a whole winter, Mr. Tull proceeds to give an account of the three manners of spending turnips with sheep, which are common to those drilled, and to those sown in the random way.

The first manner now in use is, to divide the ground of turnips by hurdles, giving them leave to come upon no more at a time than they can eat in one day, and so advance the hurdles farther into the ground daily, until all be spent; but we must observe, that they never eat them clean this way, but leave the bottoms and outsides of the turnips they have scooped in the ground. These bottoms people pull up with iron crooks made for that purpose; but their cavities being tainted with urine, dung, and dirt from their feet, tho' the sheep do eat some of the pieces, they waste more, and many the crooks leave behind in the earth, and even what they do eat of this tainted food, cannot nourish them so well as that which is fresh and cleanly.

The second manner is to move the hurdles every day, as in the first; but, that the sheep may not tread upon the turnips, they pull them up first, and then advance the hurdles as far daily as the turnips are pulled up, and no farther: by this means there is not that waste made as in the other way; the food is eaten fresh
and

G R A S S E S.

§. 1. **B**Y my own observation I am sensible, that, Grasses indicate the nature and goodness of the soil. as the sort of grass every ground bears (which is best discovered by it's ear or panicle) is a certain indication of the nature of the soil, so by the thinness of the culm, which carries the ear or panicle, and the shortness of the ear or panicle compared to what you may observe it to be in other grounds, you may make a right estimate of the goodness or poverty of any ground carrying such or such a sort of grass; for the reason holds as well in this case as it does in corn; therefore it is very necessary for our husbandman to understand the English pasture, and meadow-grasses. /

§. 2. The cow-quake grass, or gramen tremulum, The cow-quake grass though a very poor and slender grass, is no indication of poor land where it grows; for Mr. Ray

and clean, and the turnips are pulled up with less labour than their pieces can be.

The third manner is to pull them up, and to carry them into some other ground in a cart or waggon, and there spread them every day on a new place, where the sheep will eat them up clean, both leaf and root. This is done when there is land not far off, which has more need of dung than that where the turnips grow, which perhaps is also too wet for sheep in the winter, and then the turnips will, by the too great moisture and dirt of the soil, spoil the sheep, and, in some soils, give them the rot; yet such ground will bring forth more and larger turnips than dry land, and when they are carried off and eaten on ploughed ground in dry weather, and on green-sward in wet weather, the sheep will thrive much better; and that moist soil, not being trodden by the sheep, will be in much the better order for a crop of corn; and generally, the expence of hurdles and removing them being saved, will more than countervail the labour of carrying off the turnips.—They must always be carried off the ground for cows and oxen, which will be fatted by them, and some hay in the winter.

says, it is the most common grass of any in all the pasture grounds throughout England, Hoc genus in pascuis per totam Angliam vulgarissimum est : in omnibus quas unquam lustravit Clusius regionibus prata multis locis vestit. Fo. 1274.

Small
creeping
grasses and
smooth-
crested
grasses.

§. 3. The gramen parvum repens purpureâ spicâ, or small creeping grass, is no indication of bad ground, though a very bad grass : Ray says, vol. 2. fo. 1286. it is very common in pastures.—It seems to have a great sweetness in it.—The same may be said of the gramen cristatum, for that also abounds every where in our meadows and pastures. It is in English called smooth-crested grass.

Perennial
grasses may
endure the
winter.

§. 4. As I conceive, it may be laid down for a general rule, that all such plants as are perennial will bear sowing as well at autumn, i. e. before winter, as at spring, provided they are sowed early enough to take good root before winter, the difficulty lying here ; for they are plants that will endure many winters ; thus may you sow rye-grass, broad-clover, hop-clover, French-grass, &c.

I happened to carry out in my dung some winnowings of clover-seed, and laid them on two ridges of land where I had sowed wheat : the clover came up very thick at harvest ; but was not so rank as the barley-clover, it being kept down by the wheat.—It was a very wet, but not a hard frosty winter ; but from hence I do infer, that clover-seed will endure the winter, nor will it seed the next summer, nor damage the wheat.

Of the
gaping of
the seed-
vessels.

§. 5. This day, being the 30th of May (anno 1707) walking in the fields at Mr. Raymond's I observed that the seed-vessels, or cups of all the several sorts of grasses in the meadows, gape in their flowering-time, so that the mistress or plume (from whence the flower arises, which is the first principle of the seed, and no bigger than the point of a needle) may easily be conceived to be hurt by bad weather, such

as

as blights, mildews, rain, &c. I also observed the seed-vessels of the barley to gape.

I impute the great quantity of grasses this summer, 1705, to the advantage of the great drought the grass-flowers had in flowering-time, the farinaceous or flowering seeds on the stamina not having been washed off by rain.

§. 6. Hop-clover and broad-clover grasses seem to my eye, by their deeper colour the second year than the first, not to be so sweet a food then as in the first year, when they are brighter coloured. Of the nature of hop and broad-clover.

§. 7. As broad-clover falls off of it's sweetness after Midsummer (as elsewhere hinted) and will not then fat ewes and lambs, as natural grass in a good pasture will do, so I doubt not but all grasses do abate of their sweetness and spirit at that time of the year. Grasses abate of their sweetness after Midsummer.

§. 8. Varro says the medic seed ought to be sowed in the morning after the dew is off; and no more ought to be sowed than can be covered-in by the harrows the same day; for, if not covered, the least wet may destroy it. Of the medic seed.

Post secundam diem horam vel tertiam spargendum est, cum jam omnis humor sole ventove deterfus est, neque amplius projici debet quam quod eodem die possit operiri, nam, si non incessit, quantulocunque humore prius quam obruatur corrumpitur.—I believe this seed, as well as vetches, and other grain that come up in the shorter time, takes in moisture very fast, and is apt therefore, if not sowed dry, to burst and corrupt.^a

C 4

§. 9. I

^a The medic or Luferne so much extolled by ancient writers had not been long introduced into England, and was very little known in the time of our author. Mr. Tull's description of it is as follows. "It's leaves resemble those of trefoil: it bears a blue blossom very like to double violets, leaving a pod like a screw, which contains the seeds about the bigness of broad-clover, tho' longer and more of the kidney shape. It's tap-root penetrates

Hop and
broad-
clover not
natives of
England.

§. 9. I have often suspected, that the hop-clover and broad-clover we sow was not of English extraction, because it will not last above two years with us, if mowed, and but three years if we feed it as sparingly as possible, and sow it in the best land we have; therefore I thought these seeds might have been brought from Flanders, where, as natives, they might last many years;—but I am now (anno 1707) convinced from Mr. Ray, and from the nature of those plants: Mr. Ray, in his History of Plants, vol. 1. fo. 944, calls the broad-clover we sow—the larger purple meadow trefoil;—and shews the manifest differences between it, and our red honeyfuckle, and says,—it grows in pastures, but less frequent than the common purple trefoil, and is also sown in fields as food for cattle, and by some called common clover-grass: and the same author, in his Synopsis Stirpium Britannicarum, fo. 194, carries on the comparison farther, and says, it is not so durable as the lesser purple meadow trefoil, nor does it like that sow itself.—And of the hop-trefoil, vol. 1. fo. 949. he makes but two sorts, and says, the bigger, which is that we sow, grows in the fields among the hedges, especially in gravelly or sandy soils.—I do indeed conceive, that none of these trefoils are long-lived, not only because

“trates deeper into the earth than any other vegetable it produces.”—He is of opinion however, from some reasons he there mentions, that there is no hope of making any improvement by planting it in England, in any manner practised by the antients or moderns, and relates the great expence and pains the Romans were at to raise it; but to those, who are desirous of making the experiment, he recommends his new Horse-hoeing Husbandry as the only method to obtain it. Mr. Miller calls it an extreme hardy plant, and is positive it will succeed well in England, but seems to agree with Mr. Tull, that it cannot be cultivated here to any good purpose by the old method of husbandry; for the rules he lays down for it's culture are all according to Mr. Tull's manner, by the drill, and the hoe-plough. See his directions at large under the article.—Medica.

they

they have tap-roots poorly maintained by fibres (of which those we sow have fewer, and are less nourished by the capillary roots than the others, they being pretty well matted) but also because I find the white honeyfuckle, the purple, and the lesser hop-clover to increase and decrease yearly in a manifest manner, according as you improve or impoverish your ground; if you improve it with manure or ashes, you may raise a great quantity of it, I judge, from the seed, but if you mow it, and with-hold your dung, it will die away in two or three years time. — The * white honeyfuckle, I think, ought chiefly to be * Dutch managed by manures, where it likes a ground, be-^{Dutch} cause it is sweet food, and by it's trayling stalks takes root at the joints, and matts extreamly, and soon over-runs a ground, and is therefore, I believe, the longest liver.

§. 10. The more stony your ground is the more reason to sow clover, because thereby the barley ^{To sow clover on stony land.} may be the better raked up; inasmuch as either hop or broad-clover will bear-up the barley from the stones, but rye-grass, it seems, is not serviceable on that account.

§. 11. I find that broad-clover, sowed on strong clay-land, which is apt to run to sword, is not so apt to run to grass, if mowed, as when fed; for ^{Broad-clover runs sooner to grass when fed than when mowed.} when it is mowed, the clover-grass runs so rank, that it shades and depresses the natural grass, which it cannot do when fed; besides, the feeding of cattle brings a soil to it, which encourages the natural grass, but kills the broad-clover; for, where the cow-dung lies, the broad-clover will turn white and rot underneath it, and dunging of sown-grasses, such as saint-foin, instead of enriching them, brings on the natural grass.

§. 12. It seems to me a very great difficulty how ^{Inquiry into the cause why broad-clover often fails.} to account for the growing or not growing of broad-clover, whether sowed in the spring, or at autumn

autumn with a wheat-crop; for I have often observed some lands in the same ground to fail, where the nature of the soil has been the same.—On the utmost reflection I can make, I do conclude, that sometimes, where fields are sown with wheat and broad-clover, the clover has failed on account of the coldness and wetness of the ground, and I make the same judgment of broad or hop-clover sowed with oats, especially if sown early in the spring, when, though the land may not be too cold, neither in it's own nature, nor through rain, &c. for oats, yet it may be so for clover-feed.—And though white-ground in it's own nature be dry and warm, yet it is hollow and light, and, being also poor, the cold of the spring often pierces it, and so in such grounds the hop-clover as often dies as in cold clay-ground.—And it often happens, that three or four acres in a large ground may fail by being sowed wetter than the rest, by the falling of rain, which might put a stop to the sowing of the oats for two or three days, and then you may be obliged to sow again before the ground may be dry enough for the clover-feed, though it may do well enough for the oats.—Note therefore for the future to observe more critically whether this diversity does not hold.—From hence seems to arise the cause, why broad-clover seldom succeeds so well with black oats as with white, because they are sowed early, and while the ground is cold, and therefore the more care ought to be taken.

Of feeding
broad-clo-
ver.

§. 13. The autumn-clover, which shoots up at the beginning of September, arising from a young bud, and being full of sap as well as of but a short length, is easily fed and maintained throughout the winter, and therefore to be saved by being hayned; but the first year's clover, which comes up among the corn, or the growth of aftermas's-clover, being before autumn grown to a good length, requires too much nourishment (when nature is withdrawing it's strength

it's strength in order to form and nourish the buds of the next spring) to be maintained during the winter, and therefore ought to be fed down, because otherwise it would die on the ground.

§. 14. I left a patch of French-grass for seed, and it britted much; I soon eat down the aftermaßs, and hayned it from the middle of August, or the beginning of September, for the next summer's crop: the 2d of October (anno 1704) I went to see whether the brittings came up, or not; I found they came up very thick on the ground, with their seed-leaves, and established trefoil leaves, and with farther soboles prepared at the roots for the next year, and I believed they would do well, not having been fed otherwise than as above; for this feeding of the aftermaßs, to eat down the rowet, that the brittings might grow, did them good. A day or two after I observed broad-clover and hop-clover in their seed-leaves, and their trefoil-leaves, very plentiful from brittings; therefore the favouring such grounds a month after britting, and in rains, adviseable.

Caution to favourgrass after britting.
See §. 27.

§. 15. Broad-clover of the first year, i. e. after the stubble, is forwarder in it's growth, and springs faster than the second year's growth will do; therefore, if you would have early grass for your horses, a close of the first year's growth is fittest for them.— The fibres of the roots of the young clover are more spungy than those of the second year's growth; the glands also of the former are tenderer, and more easily admit of the philtration of the juices through them than the latter do, and therefore the young bud sprouts faster than that of the next year's growth.

First year's clover makes the best early grass for horses.

§. 16. Having said something of the great service of twenty or thirty acres of broad-clover to support great cattle in a dry season, in July and August, when there is more especially a stop to vegetation for a month or five weeks, I have this spring (anno 1719) Of broad-clover of the second year's growth for fattening cattle in the spring. Vid. Fattening of cattle, §. 17.

1719) found such twenty or thirty acres of broad-clover, of the second year's growth, of equal service to what it had been in July and August; for this year my broad-clover supported my great cattle from the middle of April to the middle of May.

—As I found the broad-clover of the said grounds beneficial the former year in July and August, so without the same relief this spring my great cattle must have starved; for my fodder-straw was gone by the middle of April, and no rain had fallen for five weeks before, and the wind had been north and easterly for six weeks, so that no grass of any other kind did wag, and yet the twenty acres of broad-clover did from Mid-April to Mid-May maintain twenty-three yearlings, and eight steers of four years growth, besides a great many hogs, and yet the pasture grew on them, and run more and more to a head every day, though early in the spring the sheep had fed it down bare, so that the ground was not hayned till the beginning of April, and the wind, as well as drought, opposed the growth of the grass.

Of broad-clover, it's use.

§. 17. Amongst the many advantages of sowing broad-clover one is, that it will grow during the forepart of the winter, and will support a few fatting-sheep, giving them a little hay with it, and without the grass being injured by them, provided you keep only a few in a large extent of ground, that they may not be forced to bite too close; whereas hop-clover will make no such advances in the winter months as to serve such an end or purpose: this is a good conveniency to a country gentleman, who would fat his own mutton in the winter.

Broad-clover loves moist ground.

§. 18. As I remember, Ray says, that the true broad-clover grows wild in moist fat meadows; therefore it is no wonder that it should succeed well when sowed in moist, spewy, and springy cold arable.

—At Holt there is so cold and springy a clay, that

that the farmers used not to sow it, either to barley, oats, or peas, and would but now and then clap in a few beans; but farmer Ifles (before, or about the year 1716) sowed it to broad-clover, and it got a very thick swarth, and carried a deep green colour, and yet the ground was not laid round, but was laid down flat.

Farmer Lavington of Wiltshire was of opinion, ^{Id. black, sandy, mellow land.} that a black, sandy, mellow land was the best ground for broad-clover, and that the old broad-clover hay was as good as old meadow hay, only in foddering. the leaves of the clover were apt to fall off, and so it made more waste than the other.---Mr. Raymond said, the broad-clover hay was so luscious, that neither sheep nor cows liked it so well as common meadow hay;---but farmer Lavington replied, he found not but that with change they liked it as well as the best hay.

§. 19. It often happens, that, when dry springs ^{Of clover in dry springs.} and summers follow after the sowing of clover-grasses, they will come up in a blade, and die away again without any sign of a blade appearing at harvest, and yet about that time on the following summer a thick blade shall appear above ground, and produce a good crop: this happens when the blade only was killed by the drought; but the root had escaped, and so sprung up again when rain came.---When the blade appears in the spring, tho' it dies away again, you may have hopes of it's reviving, but, if it never appeared, there can be no hopes at all.

§. 20. A Gloucestershire gentleman shewed me ^{Sickly clover should be fed, healthy mowed.} his broad-clover, and said, some part of it had been dunged, and was the better for it;---but, when I had examined it, I found the land to be of a wet, cold nature, and I suspected that most part of that which was not dunged was killed by the wet, and I believed much of the other was killed by the dung; but
it

it is true, so much of it as escaped grew the thicker and ranker for it, being supported by the dung, as by a cordial, against the wet. This broad-clover turned yellow ; therefore, if it did not recover it's colour, especially if it put forth fresh buds at the root, I thought he should feed it down, though if it recovered of it's sickly look, it ought to be mowed.

Cows
dunging
kills broad-
clover.

§. 21. I have heard say, that broad-clover would not come again where the cows had dunged, and I do believe it, especially where it falls broad on the grass; for I have turned up such cow-dung, and found the broad-clover under it perfectly whitened, and rotted by the dung, which roots I suppose were forced by the dung in such a manner as thereby to be killed, as it fares with kitchen-plants.

Of favour-
ing broad-
clover and
French-
grafs in
November,
&c. See §.
24.

§. 22. November the 5th (anno 1703) I cut up several roots of broad-clover, and found the top of the root divide itself into many tufts, as the French-grafs root does, through the center of which tufts the new soboles are formed, and issue out ; I found at this time of the year most of the soboles formed for the next year grown enough to be bit off by the sheep, which I conclude must put nature very backward, and cause her to form another central bud within the foldings of that bit off ; therefore great favour ought to be shown to such grasses at this time of the year ; — but as for rye-grafs, and other such-like grasses, though their roots divide themselves into tufts, from the center of which also, as through a sheath, the new spires of grafs spring up, yet it is but of one continued spring of grafs, not made up of dissimilar parts, and so it has no leafy head to be taken off, to so great damage as the French-grafs has ; but being bit off, it has similar succedaneous parts, which carry on it's growth, and so winter-feeding does not hurt it.

Of the
roots of clo-
ver, &c.
and infe-
rs.

§. 23. My men were fallowing up a field that had been two years sowed to broad-clover : I wondered

to

to see such abundance of slender carrotty-roots turned up by the plough, and staring an-end; I plucked at them and drew some of them up, and found they were the broad-clover roots; I measured them, and found most of them to be eleven inches long in the tap-root: it is evident from hence of what consequence the depth and strength of the soil is as well to broad-clover roots as to carrots and parsnips, and to hop-clover too; for quickly after I dug up a hop-clover root of two years growth; it was in pretty good strong ground, and I found it to be in length about six inches, and very thick, when compared with a root or two of the same year's growth; I pulled another root of hop-clover, in a piece of white-land, in the same ground, but it was very slender and weak compared with the other, and not so long.—From hence it is plain, as has been before observed, that in good land the clover is neither hurt by the sun, nor tore up by the cattle, as it is in poor land: it is also apparent, from the deep penetrating of it's tap-roots, how necessary it is their mold should be made fine and easy to them when they are sown. I also examined the rye-grafs, and I found it consisted of an innumerable number of short hairy capillary roots, and consequently feeds on the fat surface of the ground, and therefore at Midsummer, when ground is burning, it soonest burns, and is best and chiefeft in the spring, and at autumn; nor need ground be so fine, nor so deep, nor so rich for it, as for either French-grafs or clover. Rye-grafs improves for a year or two, or three years; whereas the clover dies away, and improves the surface of the land, tho' indeed it improves yearly by pasturing of cattle, by the heat of the sun, and by the moisture of both rain and dew.

§. 24. The flourishing condition of plants is no argument for the agreement of the ground with them, The good condition of the plant no argument that ground is proper to perfect the seed.

them, in case the seed of such plants be the fruit for sake of which they were sown; for, as before observed, the plant is the hardiest part, and will often flourish in a soil much too cold to bring the seed of it to perfection; thus I can have rank barley-straw, and rank broad-clover grass on my clay-grounds, where the seed of each will be cold and thin, nor will they come to due perfection.

Id. and in-
ferences.

It is plain from the reasons aforesaid, that the seed-part of the seed is the tenderest part of it, and that the plant, or herbaceous part of the seed, is the hardiest part of it; so that one need not be so very curious in changing the seed of any grain, tho' somewhat degenerated, when you sow not to produce seed, but only to raise the grassy or herbaceous part of the plant. — Therefore what gore or winter-vetches, tills, or clover-grass you may sow only for fodder for cattle will do very well from seed of your own growth, taking this caution, that every year you buy new seed for what you intend to let run to seed, and wherewithal to sow your crops the succeeding year; except indeed you raise seed of winter-vetches of your own saving, it is impossible, if you sow a great quantity of them, to procure seed time enough to sow so early as that grain requires to be sown; so remiss are farmers in threshing out their winter-vetches for the market.

Aftermath
of broad-
clover bad
hay in the
hill coun-
try.

§. 25. Our Hampshire hill-country is so cold, that the broad-clover aftermath ripens very indifferently, and the juices of it are very cold and sour; so that if the hay made of it sods a little in the wet, though housed afterwards never so dry, it becomes tasteless: this I had experience of in the year 1711; when I had such hay that had taken wet, but was reeked very dry, and came out in good order; yet the cow-beasts would not eat it for change so well as straw, but made waste of it; and the calves would
not

not touch it; yet I could see nothing more than ordinary in it, but that it had lost it's colour and smell, but was neither wet nor finnowy.

§. 26. I have observed, that if a summer proves dry, hop-clover will not hold above one year; either the sheep, feeding it close, pull it up by the roots, or else the root not striking deep has no shade, and so is burnt up by the sun. — But I have a great presumption, that that evil would be remedied, if we laid our grounds down in good heart to hop-clover; for then the root would strike deep, and would neither be injured by feeding at stubble-time, nor by the heat of the sun in summer.

§. 27. Mr. Townsend of Caln, in Wilts, tells me, that thereabouts they make great advantage of ploughing the aftermas of the broad-clover into the ground the second year, and then sowing wheat on it:—they roll it down, he says, and some, who have sheep, tread it down before they plough on it.

§. 28. The extraordinary fineness of the wool about All-cannons in Wiltshire, is imputed to the richness of their arable land, which bearing continual ploughing, the grass that springs up in the fallows is thereby always young and tender, as proceeding from annual feeds, not from old roots: it holds as a general rule in grasses of all sorts, that the younger the root the sweeter the grass. So broad-clover, and hop-clover, and rye-grass too, are much sweeter the first year than the second; it seems therefore to be good husbandry in the hill-country of Hampshire to plough-in the second year's broad and hop-clover, because, as it is coarser the second year than the first, so it must be very coarse feed in the hill-country, where it is often sown the first year.

§. 29. It seems to me, that in the vale, where land is good, and lies warm, and brings the broad-clover forward, and where they sow wheat late (the latter end of October, or after) they may plough-in the

the broad-clover pretty early in the spring, viz. by the middle of May, it having been hayned up early for that purpose; for by that time there may be a good burden, being ploughed-in, to improve the ground with, and there will be time enough to sow it, either on the second, or on the third earth; for the clover will have time to rot by Michaelmas; but in the hill-country, where both the land and the air are cold, and consequently cannot bring the broad-clover forward to a good head early enough in the spring, and where we sow wheat very early (in August, or the beginning of September) I do not see how we can have a burden of broad-clover on the ground early enough in the spring to have time, when ploughed-in, to rot, and to give the ground any more than one earth before seed-time. — Therefore, in the hill-country, I rather advise to feed the broad-clover early in the spring, and then hayn it up, so that a good burden may be ploughed-in by the latter end of July, taking a dry time for doing it, in order to sow wheat on the back of it, i. e. on one earth in August, or by the middle of September at farthest.

Advantage
of broad-
clover be-
yond hop-
clover.

§. 30. Amongst other advantages of sowing broad-clover beyond hop-clover one is, that, as I have observed, few thistles, docks, or other trumpery of weeds come up in my broad-clover grounds, in comparison of what come up in the grounds sown with hop-clover; for the broad-clover spreading, and covering the ground so much more than hop-clover does, it kills the weeds; it also grows taller than hop-clover, and runs up to a good height the second year's growth, which hop-clover does not, and is a great means to suppress weeds. The growth of weeds in my hop-clover cannot be imputed to the foulness of the seed, because I used milled-feed.

§. 31. Mr.

§. 31. Mr. Herrick assured me from experience, that, if, on their rich land in Leicestershire, broad-clover was sown, when the ground was intended to be laid down for a long time to natural grass, the broad-clover would, when it decayed, prevent the ground from swarding to natural grass.—This may very well be in such grounds as naturally run to grass, as the rich lands of Leicestershire do, inasmuch as the broad-clover may destroy the very roots of the natural grass, and kill the seedlings that may lie in the ground, and would come up, were they not checked.

Broad clo-
ver bad in
land laid
down to
grass in
Leicester-
shire.

§. 32. The poorer the ground is the closer you ought to feed down the sown-grasses: broad-clover and hop-clover ought to be fed down almost close to the root; for, if either broad-clover, or hop-clover grass be sown on white-land, or be out of proof by the poverty of the ground, and you let them run but to a full-grown leaf, it will be of a foliomort colour, and speckled with black specks, which is a blight occasioned by the weakness of the ground, and such grasses, especially hop-clover, will eat bitter, and therefore the grass of such ground should be always kept fed down close with sheep; for, if you let it run up high enough for a bite for a cow, no cattle will eat it; so the rule holds, as well in sown as natural grasses, the poorer the ground is the closer to feed them down.

The poorer
the ground
the closer
you must
feed sown
grass.

§. 33. If broad-clover, or hop-clover has a small, thin, unfappy leaf, or looks of a foliomort colour, and is out of proof, whatever the nature of the ground be, and tho' generally kind for corn, yet trust not such a ground at it's first breaking up, neither to wheat, peas, nor barley, for it will disappoint you: rather choose to sow it to vetches, and if they prove well, you may then promise yourself a good crop of barley: this I have found by experience to be true.

If clover be
thin and
sickly when
broke up,
sow vetch-
es.

Hop-clover
after-
masts comes
to nothing,
if sown
with broad-
clover.
Hop-clover
short
lived.

§. 34. If hop-clover and broad-clover be sowed together, and mowed, the hop-clover aftermasts will come to nothing; consequently the aftermasts of the broad-clover must be thinner.

§. 35. I conclude that the hop-clover commonly sowed is not long-lived where it grows wild, not above two or three years, as Mr. Ray says, in *arenosis* & *fabulosis* (which I have often observed) because in all sorts of soils that I have known it to be sowed in, as well sandy as gravelly, I never heard that it lived above two or three years.

Hop-clover
preferred to
broad-clover.
See §. 30.

§. 36. Notwithstanding what I have said of the advantages of broad-clover beyond hop-clover, yet I know many farmers are of opinion that hop-clover is much sweeter feed than broad-clover; and particularly one assures me, if a ground be sowed half and half of each, the cattle will never touch broad-clover till the hop-clover is eat quite bare.—He judged the broad-clover to be a four feed; for, said he, if cattle were put into a field of it, they would pare away the four grass round the hedges quite to the earth before they would begin on the broad-clover; but he said, the broad-clover hay was much better for either great cattle or sheep than hop-clover hay, which nevertheless was good feed for sheep, if well housed, but the broad-clover hay was full as good as any other hill-country hay.

Caution to
sow twenty
or thirty
acres of
broad clo-
ver for fat-
ting beasts
in the hill-
country.
V. Fatting
of cattle, §.
17.

§. 37. Though I think it answers my purpose, as well as others in the hill-country, to sow hop-clover rather than broad-clover, yet it is very necessary for me every year to sow from twenty to thirty acres of broad-clover, to supply me for a short time with grass for my great cattle, when other grasses are either not so forward in the spring as to pasture them, or have been burnt up in a hot summer, and so have expired till they revive in aftermasts; for instance, broad-clover may be very useful to usher in the other spring-grasses for a fortnight

night before hop-clover will be high enough to afford a bite for great cattle, and, if you mow the broad-clover, the aftermasf will be of great use, when the vigour of the hop-clover is spent, as also that of the natural grasses, which will come in turn after the hop-clover, and will hold till after the hop-clover is gone; the aftermasf of the broad-clover will then fall in turn to support that great stock of cattle maintained hitherto by hop-clover and natural grass, which you could not otherwise have maintained, had you not had such a quantity of broad-clover aftermasf, or French-grass aftermasf, to receive them till the aftermasf of the hill-country meadows, or the natural grass pastures, could be of growth enough for that purpose.

§. 38. The farmers are very apt to say, that broad-clover impoverishes land, but hop-clover does not.—This, as it seems to me, must be understood, if they are both mowed; for then, broad-clover being double the burden, no wonder if thereby the ground be doubly exhausted; on the other hand, both being fed, it should seem, broad-clover maintaining twice the cattle that hop-clover will, acre for acre, it should doubly improve the ground; but, to abate of that, it may be objected, that hop-clover being undeniably the sweeter feed consequently makes the richer dung, and therefore, being but half the quantity in burden, yet being fed, may improve ground as much as broad-clover. — Cold clays are not fit however for hop-clover, and it appears to me, that the best barley ground is the best hop-clover ground.

§. 39. I have observed, according to the forwardness or backwardness of the spring, that about the beginning of May the hop-clover will have run it's length to it's first flowering, and then it begins to be pasture for cows and young beasts, and from thence it continues on flowering, joint by joint,

Hop and broad-clover compared, and which most enriches land.

Hop-clover good feed for beasts till the 9th of June.

as the nest of bud-blossoms proceed on in growth, still leaving a blossom behind on the last joint on a stalk below, and thus it will continue to do till about the eighth, or, as it did this year (1718) till the ninth of June, about which time it will have compleated it's height, and the topmost blossoms will then wither and run to seed; all which time, being about six weeks, the hop-clover grafs is very hearty for all great cattle, and they will eat it freely till about the 8th or 9th of June, tho' the blossoms of the lowest joint are feeded; so long as the seeds continue soft and green, and do not turn blackish, so long the stalk also will retain good sap; so until this time the hop-clover grafs may be depended on for pasture for all sorts of great cattle; sheep also will eat of it thus long very well, and will bite deep of the stalk.

Hop-clover seed judged of by it's smell.

Hop-clover roots torn out of the ground by winter-feeding with sheep, and infirmence.

§. 40. ¹ It may be known, whether the hop-clover out of husk is too much kiln-dried or not, as well by it's strong fragrant smell as by it's colour and taste; for it has a strongrich smell, if not overheated,

§. 41. Walking in the hop-clover ground of the second winter's growth on the 26th of January (anno 1702) I observed more particularly than I had done before, that not only many hop-clover roots had been drawn out of the ground by the sheep, and lay without any hold at all, but half the hop-clover tufts also were more or less drawn out of the ground, some for instance half out, others not so much, but in general they were all of them jogged or loosened, which was occasioned by the sheep's being kept hard on them, and often biting in last summer's and this winter's feeding, but more especially in this last winter, which proving very wet,

¹ Mr. Miller says, in the choice of broad-clover seed that which is of a bright yellowish colour, a little inclining to brown, should be preferred, but the black rejected, as good for little.

the roots were the more loosened or drawn out; besides by the great vacancies among the tufts of the clover, compared with the first thickness they appeared in after harvest, it was visible vast quantities had perished in the aforesaid manner before the second winter; nor can it but stand to reason, that by their roots being thus shaken, and half drawn out of the ground, they must be much weakened in their growth, and kept backward, no less than trees are that suffer by such loosening at their roots.— This is therefore a strong inducement to me to think summer-fattening of sheep more profitable than a winter-breeding stock, whereby the winter charges of the latter is altogether avoided, and the clover, being winter-hayned for the summer-fattening, four times the quantity may be expected to be well-grown and deep-rooted, and, such fattening-sheep being to be well kept, there will be no danger of their much injuring the clover in the summer.

§. 42. Mr. Webb of Mountain-farley sowed the wild white and red broad-clover, or honey-suckle, and it holds the ground and decays not: he says, it is practised in Suffex, and that he had his seed from thence.

§. 43. * The melilot-leaves are generally nicked in the edges by some insect that knaws them: Mr. Bobart and I were looking on a plant of it in his garden, that was so bit; — he said, he never saw a plant of it but what had its leaves bit in that manner.— This cannot always be done by a worm in the same manner the peas are, for there were many collateral branches of it at Mr. Bobart's, which stood a foot and an half high, and had shot after it was out of the reach of the worm:

Of wild white and red broad-clover or honey-suckle. See §. 45. Of the melilot—nonfuch.

* They, who are desirous of being acquainted with the culture of the melilot-trefoil, or nonfuch, may consult Mr. Miller's Dictionary, under the article—Melilot. I believe there was very little of it sown in the fields in our author's time, nor is it yet grown common.

quære therefore what insect this must be.—It has also the name of trifolium caballinum in Italy, because horses are particularly fond of it—it seems it is an annual plant.

Of louse-
wort.

§. 44. Some will have the rattle-grass to be called louse-wort, because it makes the cattle lousy. Ray, vol. 1. fol. 769. and Synopsis, fol. 162. In pratis sterilioribus.

Of the ho-
neyfuckle
trefoil.

§. 45. The broad-clover grass, which of late years (anno 1707) had obtained some credit, as a longer living grass than the common broad-clover, and is sown under the name of cow-grass, I find to be the common purple-trefoil, or honeyfuckle trefoil, as described by Mr. Ray, vol. 1. fol. 944. distinguished from the great purple meadow-trefoil, which has always hitherto been sowed by the country farmers, and I doubt not but always will; for by experience I find the other not to yield half the burden, nor indeed, in poor ground, such as in our hill-country we commonly lay down to grass, to be a longer liver than the common sort: —but both sorts being natural to some lands, I doubt not but they will continue more years therein than when sown in poor land, or in a soil not so agreeable to the genius of the plant.

Of the les-
ser medic-
trefoil, yel-
low blof-
somed.

§. 46. Mr. Holyday, a considerable clothier in Wiltshire, was giving me an account, in the year 1707, that the Spanish wool was always troubled with a burr, and that, in cleansing some of the foulest of it, there came off more coarse foul wool than ordinary, so that he was tempted to lay it on his meadow-ground, to improve it, which brought forth a strange sort of grass, that had lasted ever since, it being many years ago. It was, he said, a three-leaved grass, and brought forth yellow flowers, and abundance of burrs with seeds in them.—I found this to be one of the annual medics I had in my garden, with burrs for the seed-vessels, and by it's
feeding

feeding every year, I suppose, it maintained itself in his ground; but what I take notice of it for, is this, he assured me, in picking the Spanish fleeces there were none but had more or less of the burrs in them, which is an argument to me, that the Spaniards sow much of this trefoil, it not being a native of their country, but brought from Persia.—Quære if it may not be a very sweet feed to breed fine wool.—It seems to me in the leaf to taste sweeter than hop-clover: I went to see this trefoil, and found it to be the lesser medic-trefoil that had small burrs;—but I since find by the clothiers, that the Spanish wool has been coarser for thirty years last past than formerly, which may be occasioned by their sowing these grasses.

§. 47. Notwithstanding the great character the *Rei rusticæ scriptores* give of the cytissus, or shrub-trefoil, for food for all sorts of cattle and fowls, and Pliny says,—it is not in danger of being hurt by heat, or hail, or snow, non æstuum, non grandinum, non nivis injuriam expavescit, yet the use of this trefoil is not to be transferred into our clime; for Mr. Bobart assured me, that the plant will not bear our winters, unless housed in a green-house.

Of the cytissus, or shrub-trefoil.—
Medicago, Miller.

Columella commending the cytissus for it's great use for cattle and fowl, says, there is no climate in which this shrub will not grow plentifully even in the poorest soil, neque est ulla regio, in qua non possit hujus arbusculæ copia esse vel maxima, etiam macerrimo solo, fol. 187.—It will not, as above noted, endure our winters in England.

§. 48. One of my tenants told me, rye-grass was Rye-grass. what they coveted in the Isle of Wight beyond hop-clover; for, said he, the rye-grass will bear the winter, and keep to a good head, which the clover will not do: I have had, added he, an acre and a half of rye-grass upon tolerable good ground, which I have hayned up from Michaelmas until within a week

week of Candlemas, and from thence to the middle of April it has kept fifteen ewes and fifteen lambs.

Though I disapprove of dunging French-grass and clover, for reasons noted before, yet it is proper to dung rye-grass; for it makes the roots of that tillow, and mat on the ground, to the utter destruction and suppression of the couch-grass.

Mr. Ray says of the *gramen foliateum*, or rye-grass; it is a perennial plant, with jointed roots, and propagates itself by sending forth fibres from it's joints, fol. 1263.—And because it's roots do farther propagate, I doubt not but it may be kept alive, by dunging it, many years longer than we usually do, or by refreshing it with soil, when after two or three years it begins to decay.

As rye-grass does not improve land as other grasses do, so it may be presumed, if Dr. Woodward's doctrine be true, the rye-grass roots, being very like the roots of oats, barley, and wheat, may feed on the same salts of the earth that the roots of those grains do, and that the orifices of the rye-grass roots consist of the same angles with those of the said grains.

Rye-grass generally lasts but three years: Mr. Lawrence, near Upton, Dorset, told me, that he had as much rye-grass seed on eighteen acres of land as was worth twenty pound, and after the seed was threshed out, the hay was better than oat-straw fodder.—I saw a reek of it in his backside, and an oat-straw reek, which were both laid open to the cattle, and they would not touch the straw, but had made such an hole into the rye-grass hay-reek, that it was ready to fall.—He said, if it was mowed green, and not for the lucre of the seed, it was excellent good for cattle.—He sells the seed for twenty-two pence, and two shillings per bushel; and sows three bushels on an acre.

Mr.

Mr. Oxenbridge shewed me some of his rye-grass hay, and I thought it was very fine hay; he looked on it, he said, as his choicest fodder for his sheep:—he mowed it when in the flower.

Farmer Ryalls of Dorsetshire affirmed, he had known experienc'd farmers say, that the very hee-grass, after mowing the rye-grass the same year it was sowed, being ploughed-in, was as good as dunging, and would pay for the seed.

I find all farmers from experience do agree, that notwithstanding rye-grass will maintain as many cattle on an acre as hop-clover will do, yet it does not improve land for corn like hop-clover.—This must proceed from one of the following two reasons, or partly from them both: viz. First, the rye-grass consisting of a multitude of matty fibres, which run on the surface of the ground, they gird and hold it so together, that, when ploughed, they cannot be disentangled from it's earth, which cannot therefore be made to work fine.—Secondly, the fibrous thready roots of rye-grass having great likeness to those of wheat and barley, as also the spiry grass-leaf being much like the blade of those grains, it may well be suspected, that the rye-grass roots suck similar juices from the earth with the roots of those grains, and so they may rob each other of their specific nourishment proper to them; whereas, the roots of hop and broad-clover being like a carrot, and their leaves different from the blade of corn, they neither gird the earth together, nor feed on the same juices the aforesaid grains are believed to do; for in all respects otherwise rye-grass should more improve the ground than hop-clover, not only as it feeds more cattle, but also as it keeps down all weeds, which hop-clover does not.

A farther reason why rye-grass is not so natural to produce a good crop of corn as clover is, may be, because rye-grass and dandel are by many her-
balists

balists ranged, as bastard sorts of corn, amongst the classes of corn : the roots of rye-grass are sweet and juicy, promising nothing of strong concocted salts ; whereas the roots of clover are very hot and tart, which argues that they have drawn to them and digested many nitrous and salt parts, which, when rotten in the earth, may well impregnate it. — Quære about the roots of peas-halm, and of the halm of vetches ; for I much suspect those roots to communicate to the earth the same benefit that clover-roots do, and a greater benefit than only by mellowing it.

Of mow-
ing close to
the ground
for the sake
of the seed.

§. 49. All plants with piked flowers, as saint-foin, and which carry a gradation of flowers one above another, on the same spike, put forth the lowermost blossoms on the same spike first, which go into seed in the same order, till at last the topmost buds flower and seed ; and of plants which bear many flowers on a gradation of joints, as the pea, hop-clover, common crow-foot daisy of the field, &c. I observe the lowermost blossoms on the joints blow and feed first ; and I do suspect, that all those plants which carry their blossoms on in a successive gradation of joints, have those series of joints all at first included in a huddle in one small pod ; at least it has been so with many, as I have observed, and as before noted of the pea ; which cluster of blossoms still advance upwards, leaving a joint bearing blossoms behind, and so on : thus it is in hop-clover ; on which when it is in flower, the cattle for a short space of time feed but sparingly, and on the uppermost parts, and topmost flowers, because, the flowers on the lowermost joints being run to seed, the seeds eat bitter, which the cattle dislike. — From hence it is obvious, that such grass mowed for seed ought to be mowed close to the ground, and the stones to be well rolled down ; else the best of the seed, growing on the lowermost joints, will be lost.

§. 50. ¹ It is evident, that where French-grafs ^{Of French} is sown, on those parts of each field, where the ^{grafs.} earth is weak, shallow, and poor, there the French-grafs will first decay.

§. 51. Being

¹ Mr. Miller says, this plant, if sown upon a dry, gravelly, or chalky soil, will continue eighteen or twenty years; but, if it be sown upon a deep, light, moist soil, the roots will run down into the ground; and in a wet season the moisture will rot the roots, so that it seldom lasts above two years in such places. This is esteemed one of the best sorts of fodder for most cattle, and is a great improvement to shallow chalky hills, upon which it succeeds better than in any other soil, and will continue many years. Mr. Lisle and Mr. Tull both agree with Mr. Miller in regard to it's being damaged by wet, but Mr. Tull will by no means allow that a shallow chalky soil is most proper for it. As he has wrote very largely on the culture of this plant, I imagine the following extract from his work may be agreeable to the reader.

EXTRACT from Mr. Tull, chap. 12. of St. Foin, or Sain Foin,—Sanum fœnum, Sanctum fœnum, or French-grafs.

There is a vulgar opinion, that St. Foin will not succeed on any land, where there is not an under stratum of stone or chalk, to stop the roots from running deep; else, they say, the plants spend themselves in the roots only, and cannot thrive in those parts of them which are above the ground. — I am almost ashamed to give an answer to this. — 'Tis certain that every plant is nourished from it's roots (as an animal is by his guts) and the more and larger roots it has, the more nourishment it receives, and prospers in proportion to it. St. Foin always succeeds where it's roots run deep, and, when it does not succeed, it never lives to have long roots; neither can there ever be found a plant of it, that lives so long as to root deep in a soil that is improper for it. — An under stratum of very strong clay, or other earth, which holds water, makes a soil improper for it; because the water kills the root, and never suffers it to grow to perfection. If there be springs near (or within several feet of) the surface of the soil, St. Foin will die therein in winter, even after it has been vigorous in the first summer, and also after it hath produced a great crop in the second summer. — The lighter the land the seed will come up from the greater depth, but the most secure way is, not to suffer it to be covered deep in any land, for the heads (or kernels when swoln) are so large, and the necks

Wet or
cold land
improper
for French
grafs.

§. 51. Being at Holt, I was told by Mr. Bailey and Thomas Miles (the winter having been exceeding wet) that the wet winter had killed abundance of French-grafs round about the country, especially where

(or strings that pass from the husks to the heads) so weak, that, if they lie much more than half an inch deep, they are not able to rise thro' the incumbent mold; or, if they are not covered, they will be malted*. —The worst seasons to plant it are the beginning of winter and in drought of summer: the best season is early in the spring. —It is the stronger when planted alone, and when no other crop is sown with it: the worst crop that can be sown with it is clover or rye-grafs; barley or oats continue but a little while to rob it; but the other artificial grasses rob it for a year or two. —The qualities following are signs by which to choose good seed—viz. the husk of a bright colour, the kernel plump, of a light grey or blue colour, or sometimes of a shining black; —yet the seed may be good, tho' the husk is of a dark colour, if that is caused by it's receiving rain in the field, and not by heating in a heap, or in the mow; and, if you cut the kernel off in the middle, cross-ways, and find the inside of a greenish fresh colour, it is surely good; but, if of a yellowish colour, and friable about the navel, and thin, or pitted, these are marks of bad seed. It's manure is foot, peat-ash, or coal-ash. The first winter is the time to lay it on, after the crop of corn is off.—[Note, other good farmers there are, who say no ashes or manure should be laid on St. Foin till it has been sowed two years, for it will force it too much, and the crop will not last so many years if ashes be sowed as Mr. Tull directs.] —Be sure to suffer no cattle to come on the young St. Foin the first winter, after the corn is cut that grows amongst it; their very feet would injure it, by treading the ground hard, as well as their mouths by cropping it: nor let any sheep come at it, even in the following summer and winter.—St. Foin is more profitable either for hay or seed than meadow grass, for the latter, if not cut in good weather, is spoiled, and yet it must be cut in it's proper season, which is but one, whereas there are four seasons for cutting St. Foin, and if you are disappointed in the first of these, you may stay till the second, and so on; besides, the hilly ground whereon St. Foin is chiefly planted, is more commodious for drying the hay, has less of the morning and evening

* Mr. Lisle differs from him in this, and advises, if the ground work light and fine, to sow St. Foin under furrow. See—Of sowing St. Foin.

where it was near the clay,—and I found it to be so; therefore neither cold nor wet land are proper for French-grass.

§. 52. Being

dews than the low meadows. The four times for cutting it are, —first, before blossoming, —secondly, when in flower, —thirdly, when the blossoms are off, —and fourthly, when the seed is ripe. He commends the first of these, which he calls virgin hay, much before the others for keeping working horses in good case, or fatting sheep in winter, and prefers it even to beans, peas, and oats. He adds however that this sort of hay is not to be had from poor ground, that is not cultivated, or manured with peat-ashes, soot, or the like. —The second, or that which is cut in it's flower, according to the most common practice, tho' inferior to the first, yet far exceeds all other kinds of hay commonly known in England. —The third, which is cut when the blossom is gone or going off, tho' greater in bulk, is much less valuable than the former two, and, after these three, you have a fourth chance for good weather when the seed is ripe.

To make St. Foin hay. — A day or two after it is cut, when dry on the upper side, turn the swarths two and two together, opposite ways, and the ground will require less raking. Make them up into little cocks the same day they are turned, if conveniently you can; for when it is in cock, a less part of it will be exposed to the injuries of the weather than when in swarth. — Dew, being of a nitrous penetrating nature, enters the pores of those plants it reaches, and during the night possesses the room from whence some part of the juices is dried out: thus it intimately mixes with the remaining sap, and when the dew is again exhaled, it carries up most of the vegetable spirits along with it, which might have been there fixed, had they not been taken away in that subtle vehicle. If St. Foin be spread very thin upon the ground, and so remain for a week in hot weather, the sun and dew will exhaust all it's juices, and leave it no more virtue than is in straw. Therefore it is best to keep as much of our hay as we can from being exposed to the dews, while it is in making, and we have the better opportunity of doing it in this than in natural hay, because we may more safely make it in larger cocks, for St. Foin cocks (tho' twice as big as cocks of natural hay) by the less flexibility of the stalk admitting the air, will remain longer without fermenting. — When the first cocks have stood one night, spread two, three, or more together in a fresh place, and, after an hour or two, turn them, and make that number up into one cock; but when the weather is doubtful, let not the cocks be thrown or spread, but enlarge them, by shaking several of them into one, and

Dunging
not good
for French
grafs.

§. 52. Being at Mr. Jeremy Horton's in Wiltshire, there were there Mr. Anthony Methwin and Mr. Holdway, clothiers, but experienced farmers, and I asked them if they dunged their French-grafs; they

and thus hollowing them to let in the air, continue increasing their bulk, and diminishing their number daily, until they be sufficiently dry to be carried to the reek. The best hay I ever knew in England, was of St. Foin, made without spreading, or the sun's shining on it. This way, tho' it be longer ere finished, is done with less labour than the other.——If St. Foin be laid up pretty green, in small round reeks, with a large basket drawn up the middle, to leave a vent-hole for the moisture to transpire, it will take no damage. These reeks, as soon as the heating is over, ought to be thatched; and all St. Foin reeks, that are made when the hay is full dried in the cocks, ought to be thatched immediately after the making them.

The feed is good for provender, and three bushels of it, some say, will go as far in nourishing horses, as four bushels of oats. All cattle are greedy of it; I have known hogs made very good pork with it, but whether it will fat them well for bacon, I have had no trial.——The threshed hay also, when not damaged by wet, has been found more nourishing to horses than coarse water meadow hay, and, when cut small by an engine, is much better food for cattle than chaff or corn.——It requires some experience to know the proper degrees of ripeness, at which the seeded St. Foin should be cut, for the seed is never all ripe together, and, if we should defer cutting till the top seeds are quite ripe, the lower, which are the best, would shed, and be lost.——The best time to cut is, when the greatest part of the seed is well filled; the first-blown ripe, and the last-blown beginning to be full.——The colour of the kernel is grey or blueish when ripe, and the husk, that contains it, is of a brownish hue, but both of them continue perfectly green for some time after full grown, and, if cut in this green plight, will ripen afterwards, have as good a colour, and be as good in all respects as that ripened before cutting, add to which, there will be less danger of it's shedding.

St. Foin seed should not be cut in the heat of the day, while the sun shines out; for then much, even of the unripe seed, will shed in mowing: therefore, in very hot weather, the mowers should begin to work very early in the morning, or rather in the night; and, when they perceive the seed to ~~shatter~~, leave off, and rest till toward the evening. After cutting we must observe the same rule as in mowing it, viz. not to make this hay while the sun shines.——Sometimes it may, if the seed
be

a Wilshire word.

they said, by no means; Mr. Holdway said, they looked on it in Gloucestershire, that dung did little good to French-grass, the dung chiefly encouraging bennet-grass, and couch-grass.—Mr. Methwin said,

be pretty near ripe, be cocked immediately after the scythe : or, if the swarths must be turned, let it be done while they are moist, not two together, as in the other hay aforementioned. If the swarth be turned with the rake's handle, 'tis best to raise up the ears first, and let the stub-side rest on the ground in turning ; but, if it be done by the rake's teeth, then let them take hold on the stub-side, the ears bearing on the ground in turning over. It is commonly rain that occasions the swarths to want turning, or otherwise, if the swarths are not very great, we never turn them at all ; because the sun or wind will quickly dry them.— Sometimes, when we design to thresh in the field, we make no cocks at all, and but only just separate the swarths in the dew of the morning, dividing them into parts of about two feet in each part. By this means the St. Foin is sooner dried than when it lies thicker, as it must do, if made into cocks : but, if it be cocked at all, the sooner it is made into cocks the better ; because, if the swarths be dry, much of the seed will be lost in separating them, the ears being entangled together : when moist the seed sticks fast to the ear ; but, when dry, will drop out with the least touch or shaking.

Of threshing St. Foin there are two ways, the one, in the heat of the day, while the sun shines, in the field, the other in the barn. Of the former, the best manner is, to have a large sheet pegged down to the ground, for two men to thresh on. Two persons carry a small sheet, and lay it down close to a large cock, and with two sticks, thrust under the bottom of it, gently turn it over, or lift it up upon the sheet, and carry, and throw it on the great sheet ; but, when the cocks are small, they carry several at once, thrown upon the little sheet carefully with forks ; those which are near they carry to the threshers with the forks only, as fast as it is threshed, one person stands to take away the hay, and lay it into a heap, and sometimes a boy stands upon it, to make it into a small reek of about a load. As often as the great sheet is full, they riddle it thro' a large sieve to separate the seed and chaff from the broken stalks, and put it into sacks to be carried into the barn to be winnowed. Two threshers will employ two of these little sheets, and four persons in bringing to them, and when the cocks near them are threshed, they remove the threshing sheet to another place.— The sooner these threshed cocks are removed, and made into bigger
 VOL. II. E recks,

said, he would not believe Mr. Holdway, who had formerly told him so, but dunged some of his French-grafs, and found that the dung nourished a natural grafs, and caused it to come up upon the surface

reeks, the better; and, unless they be thatched, the rain will run a great way into them, and spoil the hay; but they may be thatched with the hay itself, if there be not straw convenient for it.

The better the seed escapes the wet in the field, the sooner it's own spirits will spoil it in the granary barn. Seed threshed in the field, without being ever wetted, if immediately winnowed, and a single bushel laid in a heap, or put into a sack, will in a few days ferment to such a degree, that it will lose it's vegetative quality; the larger the heap the worse; but I have known it lie a fortnight in swarth, till the wet weather has turned the husks quite black; then threshed in the field, and immediately put into larger vessels, holding about twenty bushels each, and this seed has, by being often wet and often dry, been exhausted of it's fiery spirits, that it remained cool in the vessels, without ever fermenting in the least; and then it grew as well as any did that was ever planted. To prevent the fermentation abovementioned many spread it on a malt-floor, turning it often, or, when the quantity is small, upon a barn-floor, but much of it is spoiled even this way; for it will heat, tho' it be spread but an handful thick, and they never spread it thinner: besides, they may miss some hours of the right times of turning it, for it must be done very often; it should be stirred in the night as well as the day, until the heating be over; and yet, do what they can, it never will keep it's colour so bright, as that, which is well housed, well dried, and threshed in the winter; for in the barn the stalks keep it hollow; there are few ears or seeds that touch one another, and the spirits have room to fly off by degrees, the air entering to receive them.—— The only way I have found to imitate and equal this, is to winnow it from the sheet; then lay a layer of wheat-straw (or, if that be wanting, of very dry threshed hay); then spread thereon a thin layer of seed, and thus layer upon layer, six or seven feet high, and as much in breadth, then begin another stack; let there be straw enough, and do not tread on the stacks. By this means the seed mixing with the straw will be kept cool, and come out in the spring with as green a colour as when it was put in, and not one seed of a thousand will fail to grow when planted. I have had above one hundred quarters of clean seed thus managed in one bay of a small barn. We do not stay to winnow it clean before we lay
it

surface of the ground, but it did not enrich the French-grass;—nor does it stand to reason it should, the saint-foin root running down so deep into the ground that dung cannot reach it; yet it will make the stalks a little prouder, but will neither make the root to tillow, nor matt.

§. 53. On the second of November (anno 1703) I looked into my French-grass, to see the method of it's progression in it's growth; I pulled up some roots of it, and washed them, and I saw plainly, that at the top the root divided itself into many tufted branches, which tufts carried a few branches or grassy divisions, which closed together, all folding, at the bottom of the tuft, one within another: in the center of these tufts were the soboles or mistresses wrapped up by the said folding branches, which soboles were designed for the spring-shoot. In some

Of the growth of French-grass, and caution not to feed it after August.

it up in straw; but only pass it thro' a large sieve, and with the van blow out the chaff, and winnow it clean in the spring. — This field-threshing requires extraordinary fine sun-shiny weather, and therefore, in most summers, it is but a small part of the day in which the feed can be threshed clean out. They, who have but a little quantity, carry it into a barn early in the morning, or even in the night, while the dew is on it; for then the seed sticks fast to the ear: as it dries, they thresh it out, and if they cure it well, have thus sometimes good seed, but generally the hay is spoiled.—There are two misfortunes that attend carrying it in without threshing. If carried in the dews or damp, the hay is sure to be spoiled, if not both hay and seed, and, if taken up dry, the seed comes out with a touch, and the greatest part is lost in pitching up the cocks, binding and jolting in carrying home. To avoid this dilemma he relates a contrivance, which is intricate and impracticable to common farmers, and therefore I omit it.

Rats and mice are great devourers of this seed, and will take the kernels out so dextrously, that the hole in the husk shuts itself up when the seed is out of it: but, if you feel the husk between your finger and thumb, you will find it empty; also a sackful is very light. Incurious persons have sowed such empty husks for several years successively, and, none coming up, concluded their land improper for St. Foin.

tufts the soboles were better grown than others, according to the vigour of the tuft : these tufts taken up with the roots seem to stand off at a little distance from the roots, so as (being fed in the winter, by sheep especially) to be obnoxious to be bit off, and so the soboles, the hopes of the spring, may be lost ; but, if you observe them whilst in the ground, these tufts are so closely seated, and let into the very ground, that the soboles in the bottom of the tufts do not seem so much exposed, but only the leafy branches round about the tufts, which are well grown, and not dependent on the soboles ; for, if they are bitten off, the hopes of the summer-crop seems to be destroyed. Great regard ought therefore to be taken, in winter-feeding of this grass, by observing how far the soboles are advanced upwards, and whether within the power of the sheep to bite them off or not, before they are put into it. Besides these soboles, mentioned to be situated in the center of each tuft, there appears here and there an eye, or a bud, in the upper part of the root, but just to be discovered, not so big as a pin's head, which in all likelihood makes but a very weak branch the next year, but grows stronger and stronger every year, and thickens, as waxing into tufts, stronger and stronger, according as fresh soboles may annually arise out of the center of those of the last year's growth. Thus it seems, that what is but a soboles this year, thickens the tuft next year, and in it's center carries a new soboles, which grows stronger the more the tuft thickens ; by what appears, the old spreading-branches of the French-grass, such as have grown up after the feeding of the aftermasts till September, being of the nature of the winter-vetch, will endure the winter, and be the most vigorous branches of the next summer, if not fed. And whereas some say, you ought not to feed French-grass after Christmasts, it seems they do well

well that feed it no longer, but they who feed it not at all after August do better.

§. 54. I observed by digging up French-grass Of the decay of French-grass. that their decay proceeds from the same cause that the decay of the broad-clover roots does, and that in clay-land they decay soonest; this decay is occasioned by the fibres perishing, and then the canker takes the top, and eats downwards.

§. 55. After French-grass is mowed, if you are Best manner of winter-feeding French-grass. resolved to winter-feed it, I look on the following to be the best manner, first, to eat down all the wild natural grass with sheep, that being fine and green, by virtue of being shaded by the French-grass, but will burn away if not eaten, and it ought also to be kept down; secondly, to feed down the remaining part of the French-grass, which the scythe has left, but, after these are eaten, I would advise, that it should be hayned till towards September, because the roots of the French-grass running down great depths are apt, till summer is over, to draw a great quantity of sap, and, if during the months of June and July, especially if rain should fall, they should put forth gross buds, and tender shoots, and the cattle should crop them off, the root might chance to be choaked by a plethory, whereas about September the roots cease to draw in such plenty of juices, and begin to be quiet, and, if the branches should then be eaten off, the roots will not be so over-charged as to want branches to empty their redundancy of juices into.

§. 56. The reason why many plants are to be Some plants killed by cropping, others not, and the reason. killed by often cropping, and yet the natural pasture-grass no wise suffers by it, I conceive, is, because the leaf of the natural grass is a continued spire, and, when it is bit, lengthens itself out again by growth, and receives all the affluence of sap in the root; and in case it could be bit below the leafy spire into the ground sheath, yet in the tuft, from

from the same root, are a multitude of issues monthly and weekly breaking out, enough to receive the sap from the roots, so that the roots cannot be choaked by a plethora. Now, the plants, which are to be killed, by being cropped at spring and at Midsummer, are those, which being full of sap, at those times only do make issues of shoots, which being cut off, the channels consequently are taken away, and the exuberancy of the sap must burst the root-vessels and kill the plant. Some plants there are, such as hop-clover, broad-clover, and other trefoils, which may be said to partake of both natures aforesaid; for the trefoil, being bit off from it's pedestal or stalk, does not grow again, (as the spires of common grasses do) that is, out of the same stalk do issue forth no new trefoil buds; therefore it seems good husbandry to suffer the trefoil-leaf to come to some maturity before it is bit; but again, on the other hand, it has a property common with pasture-grass, which is, to be continually putting forth buds and issues, one under another, from it's roots, capable to receive all redundancy of sap; for which reason it is not killed by often cropping.

French-grass after-mass not equal to natural grass for fattening sheep.

Not to feed it after Christmas.

§. 57. At Holt in Wiltshire, walking in the French-grass with farmer Miles, I asked him, whether he found the French-grass aftermass good for fattening of sheep; he said, it was neither so good, nor would prove them so well as English grass; for the sheep would pick up the English grass from amongst it before they would heartily fall on the French-grass.—He said, the sheep might feed the aftermass of the French-grass till towards Christmas without hurting it, and after that the hurt it received was not from the winter, nor by the frosts, but because about that time, or soon after, it might spring and shoot up, and to take off that early shoot in the cold weather was that which might hurt it;

for by the side of such early shoot a little dwindling shoot would spindle.

§. 58. Mr. Short Bailly assured me, that sheep ^{Of French-grass hay for sheep.} will feed very well on French-grass hay, and make little waste.—Mr. Randolph says, the sheep will eat French-grass hay till it be above three years old, but then it grows too stemmy.—Mr. Raymond says, in their country their sheep eat French-grass hay very clean, if the grass be cut before it blows out in flower.

§. 59. Mr. Anthony Methwin thought, that ^{Different opinions on foddering} foddering of cattle in French-grass would do it as much harm as winter-feeding.—Mr. Short Bailly ^{in French-grass.} was of a different opinion, unless you turn in great cattle, which might tread it too deep; but he was confident, that folding or foddering with sheep would do it a kindness.

§. 60. I have observed, where natural grass ^{Natural grass destroys other grasses.} comes up near a hop-clover or broad-clover root, that such root will be but of short continuance, and will insensibly vanish and die away before any of the rest of the clover-grass in the same field, about which no natural grass comes up; which makes for what is said by gardeners of those grasses, viz. that they and weeds impoverish the ground, and draw away the nourishment from the plants.—Natural grass consists of innumerable matty fibrous roots, which, without doubt, running on the surface of the ground, must feed on the nourishment which the clover should have; and these grasses do, I believe, so far rob the roots of trees of their nourishment, that the gardeners, who advise orchards to be ploughed up, among other advantages to the roots of the trees, think likewise, that those trees may find a farther advantage by having such grasses destroyed from the surface of the ground.

Of rowet.

§. 61. The strength and spirit of rowety grafs is observed, after the first snow that falls, if it lies a while on the ground, to go off very much, and to have little proof in it, to what it had before the falling of the snow.

The more you improve your grounds, the more rowet you will have after the corn is cut; for the stubble-land will carry a good grafs to maintain cattle till it is ploughed up again, and this will both save hay, and keep you from a necessity of threshing out corn to a disadvantage of price.

And of
ploughing
it in.

There is often a rowet in grounds, which your own beasts, as being used to sweeter grafs, will not eat, or sometimes the growing season of the year may not afford them opportunity to eat: in this case it will seldom be proper to buy in hungry beasts to eat it up; for they may either be dear, or, when they have eat up your rowet, you will not know what to do with them, they not deserving your sweeter meat; therefore in this case I hold it to be more proper to plough-in the rowet, for the improvement of your land.

Of lob-
grafs.
Sign of
poor
ground.

§. 62. The grafs which country-people call the hooded-grafs, or lob-grafs, is apparently of but little value; for it grows up in a single culm to a root, without grassy leaves, or herbage about it's roots; it generally grows on the poorest sort of ground; no wonder then, that so much of the seed of this is commonly seen among the rye-grafs seed that is sold; for the lands, that are sowed with rye-grafs, are generally poor in nature, and impoverished farther by corn; so these grounds are apt to yield abundance of lob-grafs, for the bearing of which I hardly find any ground too poor: and I have observed, that poor ground will naturally carry a little crop of this grafs, tho' it can't maintain no other sort; the more therefore of this, a certain indication of the greater poverty of the ground.— I have at
this

this time; June the third (anno 1707) observed, that this grass has perfected it's seed, in it's seed-vessels, when other grasses were but flowering, and as it's seed-vessels easily fall, so they naturally propagate themselves.

The way to destroy the lob-grass, or hooded-grass, is to feed your grounds to prevent it's feeding, or else to enrich them by manure, so that the tufted roots of better grasses may so multiply as not to give room for the lob-grass seed, which is a large seed, to take root; the roots of that grass seeming to be very weak, as having but few fibres, and so may easily be jostled out of the ground, as the innumerable fibres of other grass-roots multiply by manure.—I suspect the lob-grass to be but an annual. The French sow it, and call it fromentel.

The *testuca avenacea hirsuta paniculis minus sparsis* grows on walls, and hillocks, and on lynchets or balks in fields, and on dry places. Ray's Synopsis, 261.—This is what we call lob-grass.

§. 63. There are several *ranunculi* common in our meadows, which, when green, blister and ulcerate the flesh; these the cattle will not touch, but leave standing in the fields, and yet, as I am told, all sorts of cattle will feed on them greedily, when dried and made into hay. Dr. Sloan, fol. 25. mentions this, to account for the cassavis-root, which, tho' strong poison when green, being baked makes wholesome bread.

§. 64. My meads are very full of dandelion; but I conclude it no sign of poverty, Ray, vol. 1. fol. 244. saying, it grows in gardens, and areas, and pastures, and flourishes through the whole summer.—I suppose it is a grateful bitter to the cattle; I do not find but they eat it very well either in grass or in hay.

§. 65. The *gramen minus duriusculum*, or small hard grass, grows plentifully on my white chalky lands, at Crux-Easton, not worth six-pence per acre.

Of the
crow-foot
or meadow
ranunculus

Dandelion
no sign of
poverty.

Small hard
grass—sign
of poverty.

acre.—Gerard says, this grass is unpleasant to, and unwholesome for cattle, and that it grows in moist fresh marshes.—And Ray, vol. 2. fol. 1287. says, on walls and dry places: so that I find it is of the nature of moss, which grows equally either on walls or wet places, where the ground is out of heart, and wants strength; therefore such grounds want their cordials.

M E A D O W S.

Mush-rooms an indication of good meadow land.

§. 1. **F**ROM the observation I made of my own hill-country meads, I find, that an indication of the goodness of the soil may be seen in the mushroom season, by it's bearing (if it be a healthy pasture) plenty of mushrooms; for those meads of mine, the goodness whereof I full well know, by my soiling and feeding them do bear the greater plenty according as they are in heart, and the parts of the same mead proportionably to the goodness of the soil; whereas those meads, which are out of heart, bear no mushrooms.

Dwarf-flax in meadows, sign of poverty.

§. 2. *Linum catharticum*, or dwarf-flax, Mr. Ray says, abounds in the drier pastures, especially on the hills.—I have great plenty of it in those meads that are very poor, but in meads which are in very good heart, tho' only parted from the other by a hedge, none of it will grow: I take it to be a great indication of poverty, where-ever it grows, and indeed, dry and poor, and fat and rich, are reciprocal terms, when we speak of land; for dunging would moisten such dry lands, and alter their property, so that dwarf-flax would no longer take up an abode in them.

Of great and common meadow grass.

§. 3. Mr. Bobart assured me, that the great or greatest of meadow-grass, *gramen pratense paniculatum majus*, is the best hay of the meads, as being most grassy or leafy, that is, the culms proceeding

ing from the roots have the most gradus of leaves on them, and are sweet: the common meadow-grass, *gramen pratense paniculatum minus*, has no leaves to it's culms, in comparison with the other, and only an herbage from it's roots that is low; yet Ray, I find, says, it is greatly coveted by the cattle, but takes no notice of the former for that excellency. Vide also Ray's Synopsis, f. 257.—But Gerard says, the * common meadow-grass, *gramen pratense minus*, grows on barren hills, and is only fit for sheep, and not great cattle.

§. 4. It seems to me, that the cause of moss in lands, or on trees, &c. is poverty: the *Rei rusticæ scriptores* say, that poor, dry, and hungry land is subject to moss, and it certainly is so; and we know also that a good strong sort of land lying wet, or a hill-country land on a cold clay, or lying shelving to the north, will be subject to moss also, and yet the land may be of a good sort, and value, when cured of the moss.—Nevertheless the same reason as above may be given for the moss abounding in the dry beggarly land as in the stronger sort of land mentioned after; for what difference is there between land according to the first instance poor and dry, having no salts or vegetable spirits in it, and the other sort of land, wherein the spirits are bound up, and chilled, and rendered unactive, by reason of the coldness of the earth, it's wetness, or it's lying to the north, so that it's spirits cannot be rarified, nor set on wing in order to exert themselves? what signify strong liquors, or juicy herbs, put in to a still or an alembick, if there be no fire set underneath to move them, and make their spirits rise?—Again, as to dry, poor, beggarly land, and as to trees bearing moss, we may compare their state to that of every dry stake or hurdle hedge, in which,

Moss a sign
of poverty.

* There is a middle sort of meadow-grass between these two.

as the sap and spirits of the wood are exhaled, which will be at a year's end, a moss will grow on the bark, and more and more the second and third year it stands, as rottenness comes on; so the moss on the body of a tree, or it's branches, is an infallible sign of the poverty of the tree, or at least in those places where it grows; it shews that it's fibres and fistular parts for conveying of juices, in those arms or limbs, are decayed, or decaying, or by some accident rendered useless.

The older
the dung the
worse for
meadows.

Why lime
and ashes
useful to
meadows.

§. 5. Columella is of opinion, that the older the dung the less profitable it is for meadows. *Fimum pratis quo vetustius minus profit, quia minus herbarum progeneret, &c.*—Columella, fo. 106.

§. 6. That hop-clover and wild broad-clover come up in meads and pasture-ground, by strewing ashes and lime, and in some measure by chalking, seems to me to proceed from the heat of those manures, which render the principles of vegetation more active, by attenuating them, and putting them into a brisk motion, whereby they become able to open and penetrate those seeds, which are plentifully brought into the ground, by the feet of both men and beasts; but the principles of vegetation were too languid before for that purpose; yet dung will in some measure do the same thing; soot also, as I have experienced in my meads, has the same effect. — It is also to be observed, that path-ways through meads and pasture grounds are more subject to clover than other places, which proceeds from the same reason; those paths by often treading become better land; feeding-meads for the same reason produce clover. — I question much whether these manures laid on arable land that is laid up to pasture would under a long time produce the wild clovers, because the seeds are not plenty on the surface but by long time.

§. 7. Mr

§. 7. Mr. Wise's farm at Newnham in Oxfordshire, lying much on the water-meadows, it happened that his meadows, and the neighbouring people's were, just before hay-making time, overflowed, and exceedingly stranded; the neighbouring people cut their grass in that condition, tho' hardly worth the cutting; Mr. Wise rolled his, which so lodged and fastened the knots of every spire of grass in the mud and strand, that from the knots there immediately sprung up a very rich aftermaß, which he thought paid him the damage of losing his first crop of hay, and he mowed it to his great satisfaction.

§. 8. Columella recommends the sowing of grass-seeds in meadows that are thin of grass, the seed to be sown in a mild season, about February, and then to dung the mead, fo. 110. When to sow grass-seed in meadows.

§. 9. It was a very burning summer (anno 1702), and we had no hay in the meads, but only bennets, and those not worth cutting: however the farmers and labourers all agreed, that it was for my profit to mow them, tho' it should not pay the charge of mowing; for, said they, the aftermaß will prove away abundantly the better; whereas the grass will not grow afresh, unless the dying bennets be cut off, neither will horses, nor other cattle eat the bennets all the winter; so the dead rowet will continue on the ground, and will prevent the growth of the grass next summer, and spoil the mowing of the meads the next year, and further, the bennets, if not mowed, would hurt the eyes of the sheep;—and they all said, they knew this to be true by experience. A meadow, tho' thin of grass, should be mowed.

§. 10. Walking in the meadows on the 28th of May (anno 1714) I saw it was very manifest, that by feeding the meadows for two years last past, instead of mowing them; I had greatly increased the Benefit from feeding meadows.
broad-

broad-clover honeyfuckle, and destroyed the yellow rattle or coxcomb-grafs.

Of raking
up hay after
foddering
on mea-
dows.

§. 11. When meadows have been foddered on in winter, take care to rake up the hay before the worms have drawn the ends of it into their holes; for then it will not rake up, but will both hinder the mowing, and make the new hay fusty.

Of hayning
up mea-
dows.

§. 12. I think meadows ought to be hayned from about the middle of August till the end of October, that, the sown grasses then going off, there may be rowet till the latter end of December for odd horses; I think this will pay best, and if then hayned, in case the meadows are in good plight, they will bring a head of grass against lambing-time.

§. 13. What up-lands you design for mowing, in order to make hay, shut them up in the beginning of February. J. Mortimer, Esq. F. R. S. fo. 25. *

P A S T U R E S.

Pastures in
the hill-
country fit-
ter for sheep
than great
cattle.

§. 1. **H**AVING, as I thought, greatly improved Crux-Easton, by laying down grounds to grass, that were more natural for bearing grass than corn; I considered thereon, that I might greatly increase the number of my great cattle, i. e. my cows, &c. and I purposed to keep oxen, knowing that I had a length of grass for a bite for them; but I found myself mistaken in this respect; for our hill-country ground, though it be a clay, and improved by manure and pasturing, yet it is of a cold and sour nature; and though, by giving it time to grow, it may carry grass to a length to answer the aforesaid purposes, yet the tops of such grass will be coarse and sour, as running to a length beyond what the staple of the ground can

* See the article Hay.

well carry, and so will do less service, in proportion to the length of time it will require to arrive to so great a growth as to maintain great cattle, than it would have done, by a less and shorter growth, in maintaining sheep; for the grass, in such case, being kept short, and not of a length beyond what the strength of the ground will carry it to, it is in proportion so much the sweeter, and better for improving sheep than it would be, when run to a greater length, for supporting great cattle; as the common saying is, A lark is better than a kite.— Again, the keeping of sheep upon such land will make a much quicker return, inasmuch as the grass, on hungry, or poorer pasture, will grow the faster (when it is kept down, by keeping sheep on it, as not to exceed an inch in growth) than it could have done by keeping great cattle; in which case, tho' you let it grow to a greater length, suppose three times as long, it will require five times the time, or perhaps more, in growing to the two inches beyond the first inch, than it was in growing that first inch: if all this be true, it is apparent, that on such ground you may maintain a much greater number of sheep in proportion than you can of great cattle; i. e. suppose the proportion of a sheep to a cow to be five to one, you shall in this case be able to maintain seven or eight sheep to one cow, and no doubt, where the land is equally fit for either, but that ewes and lambs will pay better than keeping of cows. How little profit I can, in proportion, make of a dairy, in comparison of what I can make of sheep, I am fully convinced by the great turgid udders of the cows at Gausuns, and the middling udders of my cows at Pomeroy in Wiltshire, and the lank udders of my cows at Crux-Easton; nay, the cows at Holt carry much better udders than mine, and those cows generally go with the sheep, which shows the feed to be much sweeter than mine.

§. 2. The

The goodness of
grafs lies
not in it's
length, but
in it's sap.

§. 2. The proof of grafs, be it of the same sort with that in another ground, lies not in it's length, but in it's sap and grossness; for, if a ground be poor in juices, the grafs will be so long in growing, and the sun will so harden and confirm it's fibres, that it will eat hard, and afford less nourishment than the same sort of grafs, and of the same height, which grew in half the time, the fibres of which will be tenderer than the other.

Signs of
good and
bad pasture

§. 3. This is a general rule that may be depended on in pastures, where grasses are, that naturally grow in barren grounds, such lands want manuring, and then the better sort of grasses, which carry strong roots, will easily overcome such poor grasses, they having but weak roots, and such pastures are to be looked upon to be in a better, or in a worse condition, according to the perfection and breadth of the leaf, and the length of the culm or panicle, which such poor grasses carry; again, if by manure you so alter the property of your pasture as to bring up the clovers, you must still observe the breadth of the leaf such clovers carry, and the largeness of the flower; for, if they arrive not to that growth you see them do in very good pastures, you may be assured, your ground will still pay well for farther dunging.

Of the richness of certain pastures.

§. 4. Sir W. Raleigh, c. 3. fo. 31. says, Quintus Curtius makes this report; —that there are pasture lands lying between the rivers Tigris and Euphrates, which are of so rich a nature, that they dare not suffer the sheep to lie long upon them for fear they should be surfeited and killed,—which is incident to our rank grasses, as clover, and quick-growing pastures of natural grasses, especially in the spring.

Of ploughing up ferny rowety pasture.

§. 5. I have observed ferny grounds (which have lain long to rowety grafs, and to a sour impoverished grafs) fit almost for nothing but to make cattle

cattle lousy; I have seen these grounds ploughed up for two or three years, and laid down again without being sown to grass, and have often observed such grounds to have put on a fresh face, and to have born a more sappy and juicy grass, and to have afforded a tolerable good pasture.—The reason of this I conceive to be, that these rowery grasses (having for many years shed their seeds, of which the ground was full, and the seeds alive) being by the ploughing killed root and branch, the seeds of those grasses take root, and bring forth a young tender herb, which continues so for a few years, till the roots decay again, and then it is fit to be ploughed up again.

§. 6. As it is better to plough up lands at the latter end of July, or the beginning of August, for a barley, or a peas-fallow, than to fat so late in the year, as has been noted before, so it is better to lay up a grass-ground at the same time of the year for a winter-rowet, such as will endure the frosts, which will in all likelihood pay better than late summer-feeding: those who can only use the present minute, and go to that which is most obvious, and for a present advantage, in a road with the crowd, must expect but a vulgar advantage.

§. 7. I was at Pomeroy in Wilts in October (1699) viewing lands with farmer Stephens: it was a mighty year for aftermafs-grass, and he gave me to understand, that he hayned the grass-ground which he had fed all the summer, for winter-feed, that the cattle might then have a good bite, and kept feeding the aftermafs-grass after the hay was off, because the grass of the fed grounds is stronger than the aftermafs-grass, and will better endure the winter frosts, and snows; whereas, were the aftermafs-grass suffered to grow to a good height, it would, if frosts came, be quickly cut off, or, being

washy and weak, if snows fell, it would be beaten down, and grow rotten ^b.

D O W N S.

^b Mr. Miller, to whom the world is greatly obliged for his excellent dictionary, under the articles of Barley and Trefoil complains of the ignorance, obstinacy, and covetousness of the farmers in sowing grass-seeds with their corn, and he again repeats the same complaint, when he gives rules for laying down land for pasture.—His argument against this practice is as follows.—If the corn, says he, has succeeded, the grass has been very poor and weak, so that if the land has not been very good, the grass has been scarcely worth saving; for the following year it has produced but very little hay, and the year after the crop is worth little, either to mow or feed. Nor can it be expected to be otherwise; for the ground cannot nourish two crops; and, if there were no deficiency in the land, yet the corn being the first, and most vigorous of growth, will keep the grass from making any considerable progress. So that the plants will be extremely weak, and very thin, many of them, which came up in the spring, being destroyed by the corn, for where ever there are roots of corn it cannot be expected there should be any grass; therefore the grass must be very thin, and if the land is not in good heart, to supply the grass with nourishment; that the roots may branch out after the corn is gone, there cannot be any considerable crop of clover.—In answer to this, the farmers argue from experience, and deny the fact, to wit,—“that, if the corn has succeeded, the grass has been poor and “weak, and scarcely worth saving;” for they say, it very rarely happens that a good crop of corn damages the crop of grass that is sown with it, but, on the contrary, they acknowledge that the grass has more frequently damaged the barley.—By neglecting to sow grass with our corn, say they, our ground lies idle, and we lose a year’s profit; for they will not allow September to be the proper season for sowing grass immediately after a barley crop, for a reason I shall hereafter mention, tho’ it may sometimes succeed.—They assert that the corn is a shade and safeguard to the grass, and that the latter is very seldom destroyed, but generally protected by it;—that the roots will branch but when the corn is gone, and the grass get up after harvest, tho’ it had been before kept down by the barley;—that the roots of the corn taking up part of the ground, appears to them to be of no real hindrance to the growth of the grass after the crop is cut; for the roots of the corn dying away at the time the corn is cut, cease to rob the grass of its nourishment, and by their occupying part of the ground, the grass is thereby

D O W N S.

§. 1. **I** Think it very adviseable for gentlemen who have great downs, to plough a furrow across them in some places, that they may turn the best of such lands into arable; and they may have

thereby prevented from coming up too thick, and the plants standing at greater distances from each other have more room to tillow and spread; whereas, on the contrary, if clover were sowed by itself, at least in the common way of sowing, it would be in danger of coming up too close, and of running up into a weak spire;—that it is common, even on poor land, the first year after corn, to cut a ton of clover from an acre, on good land a ton and half, and sometimes two tons, which is supposed to be as great a burthen, and perhaps a greater, for the reasons before given, than the same land would produce if sown with grass only. — As clover and rye-grass however are but of a short duration, they agree, that their crop is, generally speaking, not very considerable the second year, when they feed it off and fallow the ground for wheat. It appears notwithstanding, from Mr. Lisle's account even of this second year's crop of broad-clover, that it is not of that contemptible value that Mr. Miller has represented it; for in his observations on Grasses, he reports, that twenty acres of broad-clover of the second year did from the middle of April to the middle of May maintain twenty-three yearlings, and eight steers of four years growth, besides a great many hogs, and yet the pasture grew on them, and run more and more to a head every day, though early in the spring the sheep had fed it down bare, so that the ground was not hayned till the beginning of April, and the wind, as well as drought, opposed the growth of the grass; for no rain had fallen for five weeks before, and the wind had been north and easterly for six weeks, so that no grass of any other kind did wag: and in another place, in comparing the profit of vetches with that of broad-clover, he says, the second year's crop of clover is a very great profit beyond the rent of the ground. — The farmers however, admitting their crop is of no great profit to them the second year, with Mr. Miller could make good his assertion, and put them in a way of laying down land, which has been in tillage, to grass, in such a manner as that the sward should be as good, if not better, than any natural grass, and of as long duration;

have many inclosures, that, by reason of their poverty, may be fitter to be turned into rye-grass downs than to be inclosed, and then not to be ploughed above once in five, six, or seven years.

duration; but, in their opinion, the chief rules he lays down are not practicable, especially in large concerns, and among farmers in common husbandry.—His first rule is, that when ground is laid for grass, there should no crop of any kind be sowed with the seeds. This has been already answered.—His second is, that the season to sow the grass-seeds upon dry land, is about the middle of September, or sooner, if there is an appearance of rain.—To this they reply, that grass-seed sown at that time of the year is generally killed by the frost; so that, if you sow it at that season, you are in great danger of losing your whole crop, and, if you defer it to the March following, you lose a year's advantage; it is much safer therefore to sow it with corn in the spring, particularly on cold land, and grass so sown will be much forwarder the year following than that sown in September.—But Mr. Miller has taken notice of this objection, and to obviate it, advises to well roll the ground in the end of October, or the beginning of November. This the farmers own might be of great use, but it must be on ground that is naturally very dry indeed, or it is not easy to be practised; for the misfortune is, the weather is commonly so moist during the months of October and November, that it is then exceeding difficult to roll the ground, which is wet and dawby at that season, and cleaves to the roller, and there hardly happens one year in twenty that you can roll it.—His third rule is, to lay the ground down to grass by sowing the best sort of upland hay seeds, and Dutch clover or white honeyfuckle.—None of the farmers I have had an opportunity of consulting have any great experience in this kind of clover; their objection therefore to this manner of laying down ground arises from the difficulty of obtaining any great quantity of this fine sort of upland hay seeds; for grass for hay is cut before the seed is ripened, and out of ten bushels of hay-seed not three will be ripe enough to grow, and this last is the number of bushels Mr. Miller advises to sow upon every acre of land: besides, say they, in all pastures, be they never so fine, there will be spiry and beny grass, which is what chiefly ripens, the finer grass being kept down, and seldom producing much seed. They conclude therefore, that this may be a good rule for a gentleman, who has only walks in a wood or garden, or a small piece of land to lay down to grass, but that it will not be of any advantage to farmers, for it cannot be introduced into common practice.

BULLS and OXEN.

§. 1. **C**OLUMELLA and Palladius agree in the character of a good bull, that he should be large in limb, gentle in temper, and of a middle age; for the rest they refer us to what they have said of the ox, for the only difference between them, says Columella, is, that the bull has a sterner countenance, a livelier look, shorter horns, a brawnier neck, and a freighter belly.

§. 2. I find by farmer William Sartain of Wilts, Marks and age of a good bull. that a light headed bull, with thin horns, not thick at the root, is preferable, cæteris paribus. And the farmers of Holt say, a bull will live very quiet with oxen, or young beasts, all winter, till towards May-day, when he may grow a little rank.

It is usually said, that a bull of two years old is the best to bull cows; but I find by experience, that if he be of the hill-country breed, he will, unless he be very well kept, be too small to bull the cows of three and four years old.

§. 3. Mr. Raymond, who has better breeding Of his breed's degenerating pasture, and warmer ground than I have on the hills, says, that if you have yearling heifers, and a yearling bull of the Gloucester-brown kind for a choice breed, one must often be renewing or keeping up the breed, by buying one of those yearling bulls; otherwise the breed will soon degenerate.

§. 4. I had, in November (anno 1711) an ox fell Of a bull's killing oxen with his breath. lame in the field, as he was ploughing, and I had, in the same field, my herd of kine, and a bull going with them; the bull had never been yoked; See §. 7.

* *Membris amplissimis, moribus placidis, mediâ ætate; cætera fere eadem omnia, quæ in bubus; neque enim alio distat bonus taurus à castrato, nisi quod huic torva facies est, vegetior aspectus, breviora cornua, torosior cervix, ventre paulo substrictiore.* Colum. lib. 6. cap. 20.

however the men ventured to take him, and yoked him to an ox.—The bull bellowed as he went along, for two-three turns, but without making any resistance; he ploughed quietly that day, and the next; whereupon I was very well pleased, and thought to have continued ploughing with him, but my oxmen said, if I did, he would kill the ox he went against.—I thought they meant by horn-ing him, or bearing on him, but they said, the bull would kill him with his breath.—I was surpris-ed at the answer, and asked how that could be; they said, by blowing on him with his breath, which was very strong, and that in Wiltshire they, for that reason, always ploughed with two bulls to-gether in the same yoke. — But, said they, the strength of their breath presently ceases on their be-ing gelt.

The better
case a bull
is in the
better he
bears cut-
ting.

§. 5. In the beginning of December (anno 1711) I sent for the gelder of Kimbery to cut this bull, and he came and cut him, and he said, he thought he would do well; but, as the bull seemed to be out of case, I asked the gelder, whether that was better or worse for him; he said, they counted, that the better condition the bull was in it was the safer, and that he would bear it the better.

When
good beef
after cut-
ting.

§. 6. Mr. Biffy says, if a bull be gelt, his bullish nature will be ploughed out in three years time, and he will make as good beef as any ox.

A bull
kills an ox
with his
breath,
&c.

§. 7. It is agreed on all hands by the farmers about Holt, viz. by farmer Sartain of Broughton, farmer Stevens, farmer Loscomb, &c. &c. that an ox does not care to plough side by side, or under the same yoke with a gale, or a bull, till his bullish nature is ploughed off, i. e. till a year at least be spent in work; and the chief reason they assign for it is, that the oxen cannot abide the strong breath of the gales; besides, with their short horns they can easily hit the oxen in the face.-----They said it

was

was plain the strong breath of a bull will daunt an ox; for a bull of a year old was sufficient to keep the largest oxen in order, amongst an herd of cows, and to keep the oxen from riding them; for, as soon as the oxen once smell so small a bull's breath, they presently acknowledge his superiority without contesting it, and run away from him.— Many farmers for this reason will by no means yoke an ox with a bull, because the bull's short horns, as well as his breath, are apt to beat the ox out of the furrow, and to tire him, by his endeavouring to use an equal strength to draw sideways from the bull as to press forward.

§. 8. The north-country beasts that are of the western parts, much exceed our's in bulk and weight; for, tho' we have as deep feeding in Somersetshire, and in the vale of Wiltshire, as they have in the North, yet because we work our bullocks, that stops their growth, whereas in the North they plough with horses, and keep their bullocks unwrought, till they are fatted and killed.

Working
young
beasts hurts
their
growth.

§. 9. Columella would have the oxen be provided with large hoofs, *ungulis magnis*, lib. 6. fol. 159. But the cows with small hoofs, or of a moderate size, *ungulis modicis*, ib. fol. 166.

Signs,
small or
large
hoofs.

§. 10. Being at Holt in Wiltshire in May (anno 1711) Mr. Smith, my tenant of Deadhouse, knowing that I had newly kept two teams of oxen, asked me how they held out in feed-time that spring; I told him, very well, for the spring had been so cold all the feed-season as not to make a trial how they would bear the heat; but, said I, tho' it has been very hot weather since I have been in Wiltshire, yet I did believe, that at my return I should be informed they had born the heat well in their fallowing for wheat.—Now they have been at grass near a month before the hot weather came, whereby their bodies are well cooled, there is no doubt, replied he,

Of oxen
heating
and scour-
ing.

but they will endure the heat much the better ; but the time for their being overcome with heat was in the spring, their bodies during the winter having been dried up with dry meat, especially if any of the hay you gave them was mow-burnt or high-dried, which would dispose them to scour ; the reason of which he thought to be, because it heats them so much as to make them catch at every mouthful of green grafs, which sets them on scouring ; for which reason, he said, his father used always in hay-making time to take particular care to dry a reek of hay thoroughly for his working oxen against spring, that it might not take any heat, but come out of the reek green, which colour it loses by heating, and that though such hay loses much of it's smell, yet it is thereby made much cooler for the bodies of the oxen, and they will eat the more greedily of it.—He said, he found, that in winter the oxen would eat heated hay without scouring as well as the horses, and if French-grafs hay be well housed, and cut green, he cannot make his oxen eat of it beyond Candlemas, but if over-dry and ripe, they will not eat it after Christmase. — From hence it seems, the longer you can at first hand provide, and keep your oxen at aftermas, the better and cooler in their bodies will they be, when they come to their work in the heat of the spring ; and so they will be, the less heated hay you fodder them with in winter.

Of breaking a young ox.

§. 11.^c In breaking the young ox, Columella says, you should not suffer him to stop midway in

^c Sed nec in mediâ parte versuræ consistat, detque requiem in summâ, ut spe cessandi totum spaciū bos agilius enitatur : sulcum autem ducere longiorem quam pedum centum viginti contrarium pecori est ; quandoquidem plus æquo fatigatur, ubi hunc modum excessit. Colum. lib. 2. fol. 98. — Jugerum vocabatur, quò uno iugo bovum in die arari posset : actus, in quo boves agerentur, cum aratur, uno impetu iusto ; hic erat 120 pedum, duplicatusque in longitudinem jugerum faciebat. Plin. lib. 18. cap. 3.

the

the furrow you are drawing, but always let him rest at the end, that the hopes of resting may incline him to go through with greater spirit. If your furrow be above 120 feet long it will fatigue him too much, and therefore it ought not to exceed that length. It may be observed here, that the measure of an acre of land was the ordinary quantity that a yoke of oxen could plough in a day, from whence it took the name of *jugerum*; the furrow above-mentioned to be ploughed at one heat, was called *actus*, and was of 120 feet, and this being doubled in length made the two sides of an acre, so that when Columella advises a furrow not to be carried above 120 feet at most, he intimates the customary manner of ploughing, and agrees with Pliny in ascertaining the measure of the Roman acre, which is said by the author last mentioned, to be 240 feet by 120: this contains 28800 square feet; our acre contains 43560 English feet square; so ours is near double the Roman acre. Two oxen therefore might, in pretty light land, very well plough a Roman acre in a day.

My oxhind took three of my steers to break them, and to inure them to the yoke; he yoked two of the steers, being two yearlings, together, and so suffered them to walk about the ground, where there were no pits, nor ditches, for them to receive hurt by; he also tied the bushy parts of their tails together; the reason of which was, because they should not be able to turn their heads to each other, so as to strike one another with their horns, or, by bending their necks too much, by endeavouring to face one another, and then striving, break their necks; in this posture he let them go in the ground, if without holes or ditches, all night, or else turned them into an empty open barn so yoked, and thus used them two or three times before he worked them.

Young
beasts best
endure tur-
ning out at
winter.

§. 12. If you turn off plough-oxen to lie by during the winter, in order to plough with them again in the spring, the young steers broken the summer before, which have not been housed in winter, my ploughman judges best for that purpose, because they'll best endure to lie abroad in winter: next to these the younger beasts will best endure it.

A broad
claw a sign
of a good
working
beast.

§. 13. Working makes oxen's claws grow larger and broader than otherwise they would do; therefore a broad full claw is a sign that an ox is, or at least has been, a good working beast, for hard working and free working will, either of them, make an ox's claw so to grow, because a hard working, especially a free working beast, puts his claws strong to the ground as he treads, and thrusts them hard against it, which will cause the aforesaid effect; whereas a false-working beast will tread tenderly and lightly on the ground, and consequently never spread the horn of his claw.

Of cuing
oxen.
• shoed.

§. 14. I always ordered my oxhind, the morning the oxen are to be * cued, to tie them where they may stand in some muck-hill, or moist place, in order to supple their claws; for as our nails, after washing our hands, pare the better, so will their claws do the same, and the nails drive the easier. After cuing the oxen are always tender in their feet, and therefore should be favoured for a day after, and not worked in hard or stony ground, and, if they are at stall in the winter, the dung from their hinder feet should be flung forwards under their fore feet to keep them supple; their hinder feet will be moist enough of course.

If you sling off plough-oxen for the winter, it is good to new cue them, or at least to turn them off with good cues on their feet; for, when they are not worked, their cues will last a long time, and in the mean while their claws will grow out well, and harden against spring.

It

It is not proper to let oxen go to carting in coppies within two or three days after being oued, till the coas are a little scouled to their feet; otherwise they may be apt to tear them off amongst the stubs of the coppices.

§. 15. Cato, fol. 13. says, you should anoint the bottom and inside of your oxen's feet with liquid pitch before you drive them on the road, that they may not wear out their hoofs.—I do not perceive, tho' they used oxen so much, that they shod them.

Of pitching their feet.

§. 16. 'Columella takes notice of the custom in many of the Roman provinces of drawing by, or, as he terms it, fixing the yoke to the horns, and says it is condemned by all the writers on husbandry, and not without cause, for oxen cannot draw with that force by their horns as by their necks and breasts.

Of drawing by the horns.

§. 17. I am of opinion there is nothing saved by taking a boy to drive an ox-plough, though you plough with but six oxen; a man will keep so much the greater awe over them, and will make them go rig; nay, there is a considerable benefit, if two men go with the plough, for them to change hands in the middle of the day, and drive by turns; so much more notice will the oxen take of a different voice, that it will quicken them.

A man better than a boy to go with the ox-plough.

§. 18. About half an hour, or somewhat more, after my oxen came home from their day's work of harrowing-in oats, I went into the ox-house, to see what order things were in there; my oxen were all laid down in their stalls, chewing the cud, but no meat in their racks, not a single stalk of hay; I thought this hard usage, unless my ploughmen had first fed them, before they went to their dinners,

Of feeding oxen after work.

⁴ Illud, quod in quibusdam provinciis usurpatur, ut cornibus alligetur jugum, fere repudatum est ab omnibus, qui precepta rusticis conscripserunt, neque immerito; plus enim queunt pecudes collo & pectore conari quam cornibus. Colum. lib. 2. fol. 98.

and the cattle had eaten that serving up; therefore I asked my head ox-herd concerning it; he said; they never served their oxen with fresh hay, at their first coming from work, but there was always some of the oughts or leavings of their breakfasts left in the racks for them, which was then, when they were hungry, welcome to them, and they required them first to clear the racks of that before they gave them fresh hay. — I note this, because some idle hinds might fling such oughts to the dunghil. The evening oughts or leavings, if the oxen will not eat them, ought to be lain by for horses, &c. because their bellies being well filled over-night, they are nicer in their food in the morning, and must have fresh meat.

Of keeping
oxen's
backs dry,
and of fod-
dering
them with
straw in
winter.

§. 19. After many years using my ox-teams I was (anno 1719) almost inclinable to dispose of them, they being so chargeable to me in winter, in hay and vetches; but, whilst I had these thoughts, a Wiltshire farmer, of whose judgment I have a great opinion, told me, he should think I might at least keep one ox-team very advantageously, if it were only to help eat up my winter-straw, my cow-cattle not being sufficient for that purpose;—to which I replied, that to keep oxen all winter to eat up my straw would do me little service, when, by virtue and strength of the straw I could not pretend, in winter, to do any work with them;—to which he answered, that was a mistake; for I might very well work them some time after they had eat up their fodder in a morning, viz. from nine o'clock till two, if I put them not to too hard work, and that such working every other day would rather do them good than harm, and would get them a stomach to their meat.—I made a scruple of working them so many hours, and said, 'I could contrive work for them of great use to me, and work them only from nine till twelve;—but he insisted, that
I might

I might work them from nine till two, if I contrived it so as to give them the best of my straw, tho' he acknowledged that straw was not so good with me as with them in the vale. He said farther, that nothing in winter beat out cows or oxen more than their being wet on their backs or loins; it was therefore of great consequence to keep them dry overhead, in order to hold them to their proof; for, if cattle carried their hides wet day by day, it was as bad to them as it would be to us to wear wet cloaths, and must make them sink or pitch.—From hence I resolved, that I would oblige my servants, during the winter, at least in wet weather; to tie up my cow-cattle in shed-houses, and to bring up my oxen from their straw abroad, in wet weather, to eat it in the ox-house; —and for the same reason it seems to me, that, if I work my oxen in winter, as above proposed, by vertue of straw, I ought not to work them in cold and wet weather; for working in one such day, will beat them out (as the farmer called it) and make them to pitch more than working three days in dry weather.—To this however I objected, that, tho' I tied up my cows and oxen in wet weather, yet I could not avoid letting them out to water in the wettest day, and though it rained never so hard;—to which he replied, that letting them out to water at such a time would do them no hurt; it was only their continuing in the wet for hours together that did them prejudice.—He said farther, that, if I put cows or oxen under skillins, or penthouses, though they lay open to the air on one side, that mattered not, provided their backs were dry.

The same farmer making me a visit, I told him what good success I had had in foddering my oxen with straw the last winter, and how well notwithstanding they did their work.—He told me, he did not doubt but they would do so, otherwise he would
not

Not beyond
six or seven
years old.

not have persuaded me to it; but, said he, I would not advise you to keep oxen, you propose to work, with straw in winter to above six, or however, not to above seven year old at farthest; for, when oxen are past that age, they fall off of their stomachs more than younger cattle will, nor can they hold their flesh with so coarse meat, and work withal, as younger cattle can.

Chaff for
oxen.

§. 20. Barley-chaff is not proper for oxen, but wheat, and oat-chaff they may eat: the barley-chaff is apt to stick under the roots of their tongues.

Vetches for
oxen.

§. 21. The plough-oxen may eat freely of the winter-vetches, and they will do them the most good at the beginning of winter, before they are forced to be housed, and whilst they have yet some grass left in the field to eat along with them; for the cold rowety grass, and the dry and hot winter-vetches will qualify one another.

* or bent-
ing.

By all means, however, if, in the hill-country, you pretend to fat oxen, or to work oxen in the plough, take care to have a good reek of good old vetches in store against summer; for it will rarely happen but they will have great want of them, at least throughout the whole month of July; for the pasture-grass in the hill-country, either burning up, or giving off growing by Midsummer, it is the oxen and cow-cattle's * benetting-time, till a fresh spring shoots up by means of rain in August, when the corn-fields begin to open to their pasture, tho' the sheep which bite close may fare well: at this time such a provision of vetches to go on with the rowet, and the small pickings of grass left, will be a vast support to, and of great consequence with the oxen, nor is the want of old reeked vetches, in this case, to be supplied by green vetches, which at this time of the year may be had in plenty; for, though at this season they are a good maintenance for horses, yet they are unkind to the horned cattle, and

and will be apt to scour them, and make them sick.

§. 22. It is agreed by the Wiltshire farmers, that from about the beginning of March to the beginning of May, i. e. till the ploughing oxen are put to grafs, more especial care ought to be taken to give them hay in their rack, in little parcels, small pittances at a time, because, the hay then growing dry, and the oxen growing hot, their breath will be so much the more apt to blow their fodder, and then they will not eat it. Of giving them hay in small parcels.

§. 23. In inclosures in the hill-country, where there are dead hedges, especially if oxen are kept there, ragged posts set up in the fields, for them to scrub against, will be of great use to the oxen, as well as a safeguard to the hedges. Of scrubbing posts for oxen, to save the dead hedges.

§. 24. It was the 15th of November (anno 1713) when my oxhind proposed to me to take my plough-oxen into the house for the winter, it being then dry and mild frosty weather; on the contrary, my bailiff was of opinion, that they might, for that reason, lie out a few days longer; but the other said, the weather being dry was the reason that he proposed housing them at first when their backs were dry; for it is a saying in Wiltshire amongst the plough-men, that, if in winter you staid till the rain came before you housed oxen, and then their backs were wet when you first housed them, their coats or hair would be apt to peel off in the winter.---^c The ancients are very particular in their directions to keep the backs of oxen dry, and to rub them well when they come from work, and pull up their hides that they may fit loose and not cling to their flesh.

^c Boves, cum ab opere disjuncti, substrictos confriat, manibus comprimat dorsum, et pellem revellat, nec patitur corpori adherere, quia id genus morbi maximè est armentis noxiun. Columella, fol. 99.

COWS and CALVES.

§. 1. ^a **T**O keep cows from being high in case before bulling, and the bull to be in high case, is Columella's rule, as well as Varro's. ^b It appears also by Columella, that in August and September they gave their cows leaves as a good part of their food. ^c He is likewise of Varro's opinion, that if the bull turns off to the right, it is a bull calf, and, if to the left, it is a cow-calf, but that only in case the cow takes not bull again, which rarely happens. ^d He and Palladius are generally agreed on the marks that distinguish a good cow, to wit, that she should be tall in stature, long in body, of a vast belly, broad forehead, black large eyes, neat light horns inclining to black, hairy ears, flat jaws, a dewlap and tail very large and long, hoofs and legs of a moderate size.

Choice of a
cow.

§. 2. Markham in his Country Contentments, fo. 71. says, in the choice of a cow, she should ever have four teats, but no more; her forehead broad and smooth; her belly round and large: a young cow is the best for breed.

Marks of a
good cow.

§. 3. A notable dairy-woman informs me, that in Leicestershire they observe, and she has observed

^a Propter feturam hæc servare soleo, ante admissuram, mensum unum, ne cibo et potione se impleant quod existimantur facilius macræ concipere: sed tauri è contra impleantur duobus mensibus ante admissuram. Varro, lib. 2. fol. 58.

^b A calendis Julii in calendas Novembris satientur fronde. Colum. lib. 6. c. ap. 3.

^c Mas an femina sit concepta significat descensu taurus cum iniit; siquidem, si mas est, in dexteriores: ad idem Aristoteles.

^d Altissimæ formæ, longæque, maximi uteri, frontibus latissimis, oculis nigris et patentibus, cornibus venustis, et levibus, et nigrantibus, pilosis auribus, compressis malis, palcaribus et caudis amplissimis, ungulis modicis, et modicis cruribus. Col. lib. 6. cap. 21.

the same herself, that a cow with thick horns, which do not lessen and thin in a taper manner, gives not so much milk as the cows with slender horns do.

§. 4. If you would choose a cow to feed, handle ^{Mark of a} her navel, and, if that be big, round and soft, she ^{fat cow.} is surely well-tallowed. Markham, lib. 1. fo. 62.

§. 5. When a cow has a calf, one may discover ^{A good} by the thriving of the calf, whether the cow gives ^{cow known} very good and rich milk, or that which is ^{by the} but ^{thriving of} washy; but some, when they bring the cow and ^{it's calf.} calf to market, will beforehand fill the calf's belly with two cows milk; but then the cow's udder, by it's fulness, will be apt to shew it.

§. 6. In discourse with a notable cow-keeper he ^{Age of a} said, that he counted not a cow old till she was ^{cow.} eighteen or twenty years old, and that cows would very well live so long, though but few, as he believed, kept them beyond twelve, or thereabouts; they would not abate of their milk till they were very old.

But another of the same profession replied, if a cow be kept above eight years old, though she might give good milk without abatement, yet she would be worth nothing for fattening, she would be tough; and that she must be helped up, when she was down, unless she were well fed; he also said, that many young cows would take a trick of not rising of themselves, but of lying, when down, till they were helped up.

Varro, lib. 2. de re rustica, c. 3. fo. 51. says, a cow is not good for breeding after she is ten year old.

The age of a cow, after she is three year old, ^{Known by} may certainly be discovered; for every year after ^{the horns.} that age at the root of her horn she will put forth a rundle, like a curled ring: on examination I saw an instance of it in my own cows.

An old cow also will lose her fore teeth in her ^{And the} lower jaw, and, if you should buy such a cow for ^{teeth.} the sake of a good calf by her side, and believing she may give good milk, if she has lost a tooth be-

fore, you must not think of keeping her above a year or two at most, but must fat her off. If a cow be pot-bellied, it is a certain sign she is old.

Age, when
a cow is in
perfection.

§. 7. The farmers of the Isle of Wight agree, that a cow is not in perfection for giving the most milk till she is six year old, and that it is common in that country, where a person rents land of one landlord, and cows of another, to give ten shillings a year rent for a grown cow; but as for a heifer of the third year, which is the first year of her giving milk, you may have her milk for her keeping, and tho' she may the next year let for ten shillings, yet she will not give so much milk then as she will do afterwards.

Caution—
not to keep
a cow be-
yond six
years old in
the hill-
country.

§. 8. I was telling farmer William Sartain, and farmer Isles, my tenants in Wiltshire, the cold winters in the hill-country fell so hard on old cows with calf, they being long kept to straw, which is with us sower than ordinary, that I was resolved I would not keep a cow to the pail for the future beyond six year old;—they agreed, that I was much in the right of it.—Farmer Isles said, the keeping cows so long and hard to straw, and having but little rowet for them, was the occasion of their running out so much to be pot-bellied, as they usually do.

And I am since confirmed by experience, that in cold hill-country air, where the straw is also coarse, by reason of the cold land it was produced from, cows should not be kept till they are old, but be sold off at six, or seven years old at farthest; because such cows, after that age, and in such a place, will pitch much at the end of winter, especially after calving time, nor will they pick up their flesh again before summer is far gone, whereas young cows will bear the hardships of winter with four fodder better than old cows.

Signs of a
free mar-
tin.

§. 9. Mr. Bissy coming to see me, and looking out into the backside, told me immediately, that I had a free martin.—I asked him how he knew a free martin from a cow; he said, very well, it be-
ing

ing easy to be seen ; for, said he, the bearing of a martin gathers up more like a purse, and is not so firm and turgid as that of a cow ; her head also is coarser, and openet horned, like an ox, neither has she such an udder as an heifer not with calf, but a smaller. — He said, the meat of a free martin, if well fattened, would yield an halfpenny in the pound more than cow-beef would do.

Amongst the cows the Romans knew that there were such as we call free martins, which they called *tauræ*, and such they yoked with oxen. Free martin known to the Romans. Columella, lib. 5. fo. 166.

A free martin is a sort of a barren cow, which hardly carries any teats to be seen ; she will never take bull ; she fats very kindly, and in fattening she'll grow almost as big as an ox ; she is counted especial meat. When a cow brings two calves, a cow-calf and a bull-calf, the cow-calf will be a free martin, and will never bear a calf ; but I believe the bull-calf is not affected in the like manner, but will propagate his species as other bulls.

§. 10. Mr. Biffy, laying his hand on an heifer, said, she was barren ; I asked him how he knew that ; he said, very easily ; for, said he, when a cow has not taken bull, or not gone through, her bearing will be firm, and turgid, whereas, after she has taken bull, and proves with calf, her bearing shrinks, and grows lank, and then again, about two months before her calving, it grows turgid ; but this fullness of your heifer's bearing cannot proceed from her being so forward with calf, because she looks lank, nor can I feel any calf ; for he felt her ; and, said he, if we graziers knew not these things, we should suffer much. Signs of a barren heifer.

§. 11. Captain Tate of — near Loughborough, observed to me (anno 1766) that, notwithstanding the Leicestershire land was richer than that of Lancashire, yet they could not keep up the Lancashire breed. Why the Lancashire breed degenerates in Leicestershire.

breed of cows and calves they bought of them, but they would degenerate so, that in the third descent they had their Leicestershire breed again.—He could not tell me the reason of it, but the next day meeting with Mr. Clerk, he said, he conceived the reason to be, because they in Leicestershire were not so choice in the breeding, and managing of them, as the dairy men in Lancashire were ; for, said he, in Lancashire I have known them give eight, or ten pounds for a bull-calf of a year old, which shall then be in his prime, and large enough for bulling the cows, but will decline and grow worse at two years old ; then, to make their calves large, they wean them with unskimmed cows-milk, whereas we in Leicestershire give them skimmed-milk and whey, after their having had new-milk a month, and this regimen it is that so much improves the Lancashire breed beyond ours.

I asked the abovesaid Mr. Clerk why the dairy-men in Leicestershire did not prove as good husbands, and order their cows as well as those in Lancashire did ; he said, it would not pay, nor be worth while ; for their land was better than that of Lancashire, and turned to a better account in breeding coach-horses and mares, and fattening of cattle, and they kept but small dairies, and therefore it would not be worth their while, where they milked but a few cows, to go to such a price for a bull.—He said, they observed farther, that their large breed of coach-horses, if carried into Yorkshire, would degenerate and grow small, and if the pad, and saddle-breed of Yorkshire, were brought into Leicestershire to breed, they degenerate into a fleshy heavy-limbed sort of horses.

Our hill-country farmers and dames are of opinion, that weanling-calves, or yearlings, brought out of the vale, do well in the hill-country ; for they are no otherwise kept than they ought to have been

been in the vale, that is, wintered with hay; but it is true, cows from the vale do not do well when they come to the hills.

§. 12. Being in company with farmer White of Catmore in Berkshire, and farmer Crapp of Ashmonsworth, Hants, I was saying, that I had winter-feed, especially rowet, for more beasts than I had, and did therefore intend, about Christmas, to buy in beasts of a year and an half old.—No, said farmer White, I would advise you to buy heifers forward with calf, and, as you have rowet, you may keep them the better, and in all likelihood they'll fetch a good price in the spring; for last summer (anno 1701) was so dry, that abundance of calves either went through, or will come in late; therefore a forward heifer must yield a good price;—and you will not fail in having them that are forward with calf at Christmas; if you go behind them, and draw their teats, and, if milk comes, they are for your purpose.

§. 13. I asked a notable Wiltshire dairy-man, if it was not a frequent practice to fill the calf's belly with milk the morning they drove the cow and calf to a fair, to be sold, in order to make the cow's udder appear full all day, and whether they had not a way, by drawing a string through the calf's nostrils, and tying it in the roof of the mouth, to keep the calf from sucking; he said, some did practise these things, but he never did; nor would he ever buy a cow in a fair, if her milk seemed to be pent up in her udder, nor where no sign of the calf's having sucked that day could be discovered; for in such case he should suspect some cheat; nor did he ever serve a cow or calf as above said, and yet never found but they went off as well as other people's, who might use such arts.—He said, they had also a way of besmearing the cow's teats with cow-dung, and then the calf would not suck, and in driving

Cheats used in fairs.

the cow to the fair her udder would be so dirty, and dusty, that it would not be seen.

Caution—
not to let
cows to
hire,

§. 14. I would never advise any man to let his cows; for it never gives any content to either side, and the tenant will in all likelihood be negligent in letting the cow take bull that he may milk her the longer; for if she be not with calf, she will have milk all the winter in good plenty, and, when spring comes, he cares not; for he knows she must be changed off.

Of fattening
cows at
London,

§. 15. A person who lives in Moorfields, near to the cow-keepers and renters there, and says, he is acquainted amongst them, tells me, that the cows are fed with such foul and rank food, that it rots them in the space of two years, or two and an half at most, and the cow-keeper's practice is of course to put them away fat by such time, lest they should be found dead on a sudden. They are soon fatted, being good meat all the time they are milked; the food they give them is grains, cabbage-leaves, and bean-shells, of which last their milk will taste strong during the season.

A cow or
calf well
summered
is half win-
tered,

§. 16. I was sensible this year (1718) that a cow well summered is, as the saying is, half wintered; for this summer was two years I weaned twenty calves; that summer being wet, there was consequently plenty of grass, and those calves were very lusty against winter, and eat their straw, and thrived very well all winter with straw, and the advantage of running in my wood; but, on the contrary, this last summer being very dry, and grass running short, my weaned calves, eleven in number, were pinched before winter, and so came but poor to their straw, the consequence of which was, they never eat their straw well, nor did they care to abide in the coppice to pick on the brier-leaves as the former calves used to do; so five of the eleven dropped off in the winter by the wood-evil, and the other

fix

six I was forced to take to hay by the middle of February, and could hardly preserve them, nor could I thereby raise them but very little by the middle of April.

§. 17. I asked farmer Chivers of Gausun in Wilts, how much hay he consumed in a year; he said, above sixty ton;—I thought that was a great quantity for his stock; he replied, his was a dairy of cows, and that, when they had calved, they would eat a prodigious quantity of hay.—Why, said I, have cows when they have calved greater stomachs than before? Yes, said he, a cow when she has a calf to maintain, and is also milked, will eat as much as two other cows; a cow in that case will eat as much as an ox.

Many other farmers agreed, that a milch-cow would in winter eat as much hay as a fatting-ox; for, said they, the drain from milking her is so great that it keeps her up to a great stomach.

§. 18. The spring (anno 1714) proving so cold and dry, that I could have no prospect of mowing a good swarth in the French-grass, about the 24th of May, I put in my working oxen, and milch-cows to feed it down, it being, as I thought, a noble bite for them; but we soon found, that the cows yielded less milk than when they went in the broad-clover, nor did the oxen fill themselves so well as to be able to go through with their work, and so my oxhind feared.

§. 19. Being at Pomeroy in Wilts, and seeing farmer Stephens had sowed vetches, I asked him, why he had done so; he said, they were excellent good to give his cows that calved in winter, or early in the spring; for such cows would often be chilled in their calving in cold weather, and such meat would be a cordial to them; he had had, he said, cows take such colds in their calving, that their

A cow after calving eats much more than before.

Id. a milch-cow in winter.

French-grass in spring not equal to broad-clover for cows, &c.

Vetches, a cordial to cows after calving.

bones would be sore a great while after, so that they would not be able to set a leg forward; in such case he made a great toast for them, and put it into two quarts of strong ale, and gave it them, repeating it two or three times, and found it did a great deal of good.

Id. rough
barley,

The country-men generally agree, that to give a cow rough barley when she has calved, is very helpful to the bringing away the cleaning.—Quære, whether the reason must not be, because it is a heartener, and a strengthener, and that the cleaning stays behind by reason of lowness in the cow.

When cows calve, especially if they have had any hurt, or are in poverty, the cleaning often does not come away well, but will hang down, and if it be neglected, and the cow has not in a day or two a drench to bring it away, by heaving and straining to bring it away, she will fall into the running of the reins, which will come from her like the white of an egg; this will much daunt the cow, and sink her so, that she will not soon get her flesh again. To prevent this, and to bring away the cleaning, I have known it a common practice to give her a handful or two of mistletoe; to which purpose Mr. Ray also observes, vol. 2. fol. 1584, *Commanducatæ fruticis frondes, & depastæ à jumentis & vaccis à rusticis ad secundas remorantes ejiciendas utiles censentur.*

In the hill-country let the cows go dry before you fodder them in winter.

§. 20. In the hill-country, where the winter provision for the cows is but ordinary, it is certainly best to let them go dry when they go to winter-fodder, or rather a little before that time, that they may be dry against they go to fodder, and then you should also contrive as much as you can, to fodder them where they may have rowet:—this is the way to keep them in case all the winter, and to hold up your cows to a good body, and to bring them to the

the pail in spring with good udders, and to support a good breed of calves : by being let to go thus early dry they will be better able to walk a field at some distance, where rowet may be had, or, if you have conveniency of foddering at a distance, they may abide where the rowet is to be had.

§. 21. The rule is not to give the short fodder in wet weather, because the cattle will be more apt to waste it and trample it under foot, than they will that which is longer. Give cows long fodder in wet weather.

§. 22. Cows that are tied up in a cow-house never look so well, nor are in so good case as those that are foddered in a backside ; for they want the airings, nor will they prove ; tho' it is possibly they may require less meat, as all unhealthy creatures do. A cow-house not equal to a backside for foddering.

§. 23. I asked farmer Lake, what was the reason that it harmed a fat beast to lick himself ; Mr. Bachelour of Ashmonsworth was then in company, and they both said, that where a fat cow licked, it would make a jelly in the place, under the skin.— And, said farmer Lake, such cows do not begin to lick themselves till they begin to pitch, and sink by faring hard ; therefore the butchers care not to meddle with such cattle ; for where they have licked the tongue leaves a mark, and the butchers can easily see it. — I suppose when they begin to pitch they begin to itch, which is the reason of their licking. Of cows licking themselves.

§. 24. It was May the 11th (anno 1702) when some farmers, good judges of cattle, were looking on my calves, which were then yearlings, and they being in a lusty condition, the farmers said, if I did not keep them from the bull, they would take bull by Midsummer, which would spoil their growth. Of a cow's going to bull.

They said farther, that cows would take bull the sooner for a bull's going with them, meaning, that if cows were lusty, they would take bull in three or four days time, if a bull were put to them, though otherwise their desire would not come so soon.

One

COWS and CALVES.

One of them said, for the hill-country cows that were small, a young bull of but a year old, and a small one, was best.—He had, he assured us, a lusty cow spoiled by a three-year old bull, which flung the cow in the cow-barton amongst the dung, and put out her hip.

In the beginning of October (anno 1703) I observed a cow, that had gone through her, riding my other cows; coming to Holt, and being afraid she might prove troublesome to my cows with calf in the foddering-yard, I asked Stephens of Pomeroy, if she would be for bulling every three weeks in winter, as well as in summer; he said, no; she might not be for bulling above once or twice in the winter, because it was winter.—But, said he, if a cow goes thro' in the summer, and is apt not to stand to her bull, if immediately after she is bulled you take about a pint of blood from the rump-vein of the tail, it will make her stand to her bulling:—and further, said he, if you would have all your cows come in well together, you must milk a cow while she is bulling, and give each of the other cows that you would have take bull a pint, or a quart of the bulling cow's milk, and they will in two or three days take bull.—Another said, that spatling-poppy would do the same thing: I had a maid, said he, lately used to the dairy-countries, who, when I had a cow not apt to take bull, went into the grounds, and gathered a large handful of spatling-poppy, and held it to the cow, and she eating it readily went to bull in two days after, and this, she said, in their country seldom failed.

Mr. Wiltshire of Road coming to Holt while I was there, I had some discourse with him about cows; it was in January (anno 1698); he said, he had one that had gone through this year;—I asked him, how that came to pass; he said, he suffered her to take bull at a year and a quarter old, letting her

go on Road-common, where there were young bulls of that age ; so she brought him a calf at two years old, and when they calve so young, they usually go through the year following*. —I wondered much that a cow should calve so young ; —upon which he said, down in Somersetshire they used commonly to let their young cows, where they were well maintained, take bull at a year and a quarter old. — The same day farmer Pain shewed me two fine heifers with calf, that took bull at a year and a quarter old, but it was by accident and against his will, the bull breaking loose to them. —He said, what Wiltshire observed of such heifers going through the next year might be very likely in their poor keeping, but would not so likely fall out if they were well kept.

Farmer Stephens, and farmer Chivers say, unless the keeping be choice good, (such as Gausfuns near Bradford-Wilts) it is by no means proper to aim to have calves to come at Candlemas, nor to let yearlings take bull at Midsummer ; it utterly spoils their growth ; —nor does Stephens like, that his heifers at Pomeroy should take bull till two year old. — Yet they say, that sometimes, if they are very well kept, though not often, heifers will take bull at a year old, that is to say, at the beginning of May, though regularly they will not take bull till towards Midsummer ; but this is to be understood of such as were calved about Candlemas, there being almost a year's advantage gained over them that were not calved till May-day.

I was telling a great Somersetshire dairy-man of a heifer I fattened, which from Midsummer to March would never stand to her bulling, nor did she rise in flesh, fit for killing, by March, though she had corn with her hay most of the winter. — The farmer

Sir Ambrose Phillipps's shepherd says the same with farmer Wiltshire:

said,

said, he had had such heifers, and that they never would fat inwardly : as soon as one finds them take to that trick it is best to sell them off.

I was saying to Mr. Clerk of Ditchley in Leicestershire, that I had heard some farmers say, that, though a cow, which never had been with calf, would not fat kindly till she had been bulled, and was with calf, yet a cow that had once had a calf would take fat well enough, though neither bulled, nor with calf. — To which he said, that the latter might prove better than the former, but nevertheless the latter would not come forward, nor prove any thing so well before as she would do after she had taken bull, and was with calf, but would every three weeks be on the fret, and run about chafing herself ; and lose as much flesh in the day or two she was for bulling as she had got in three weeks before.—He says, if one buys in, what we call, barren beasts, to fat, they will require, and take bull as soon as they grow a little in proof.

Id. and of
keeping a
bull to go
always
with the
cows.

§. 25. I have found by experience, that those who keep ploughing, and fatting-oxen, as I do, ought always to have a bull to go with the cows, to keep the oxen from riding them ; for otherwise it is impossible to keep them separate ; for the oxen will break over hedge and ditch after the bulling-cows.—The best way, in order for this end, is to buy a fine bull-calf from North-Wiltshire every year, and then you'll always have a bull of two years old, and a bull-calf, which will come up yearly for use, one year after the other ; and the bull will be so master over the oxen, that the cows and oxen may go together without inconveniency ; nay, it is a good way to have a bull go with cows, if it were on no other account than to prevent the other cows from riding those which were for going to bull.

§. 26. It seems to me, that in the spring of the year, and throughout the summer, till the barren cows have taken bull, the oxen ought to be separated from the cows, both at grafs, and in distinct foddering-yards, because the oxen will be riding the heifers, and straining them, as well as beat out themselves.

Oxen should be kept separate from cows in summer.

There are often many damages and losses, which fall out in the way of husbandry, to rectify which, it may be, it is inconvenient at that present time, and so one bears with them; whereas it is ten to one but we shall be much more incommoded in consequence, for want of rectifying at first the first damage or loss.—An hundred instances of this nature might be given; a cow, for instance, wants to take bull, and it may be, at the first approach of the spring, you are not provided with a bull, and it being a busy time, it would very likely be a small inconveniency for you to spare a person to drive this cow to a neighbour's bull, perhaps a mile or two off; but this inconveniency of the two is generally the least; for, by not doing so, your oxen, if you keep any, will break out after this cow, and teach others to do the same, which they will hold to ever after, to a great inconveniency to your corn, &c. And it is almost incredible how even oxen in a distant ground will snuff up the effluvium of a cow going to bull, and break over hedges after her.

§. 27. As I was shewing a cow to a butcher, this cow, said he, is with calf.—I asked him how he knew; he said, very easily; when a cow is twenty weeks gone with calf, if one went to the right side of the cow, and pressed hard against the flank with one's hand, and did it with a swift motion, one might feel the calf knock against one's hand, of the bigness of a ball; till the calf be twenty weeks old, or thereabouts, it lies up high under the flank, but then, as it grows bigger, it falls down lower, and then

To know when a cow is with calf.

then one must feel lower for it; and where there is another person on the other side of the cow, and he shoves the flank on his side towards you, it will help the perceiving it, when she is but very young; and so the graziers, by the hardness and bigness of the calf they so feel, judge how far the cow is gone.

Id. and
how far
gone.

Two understanding farmers were with me, viewing my beasts, and they observed a heifer's udder to spring much; whereupon my bailiff said, she would calve in a day or two; — but the farmers said, it might be a week first; for a heifer will spring fuller in her udder, and for a longer time before calving than a cow.

William Sartain, an experienc'd farmer of Broughton in Wilts, assures me, a heifer will not, when she is half gone, so easily discover herself to be with calf as an elderly cow will, because the sides of an elderly cow fall in more; in judging of an heifer one may often be mistaken. — He says, when a cow is half gone, the graziers reckon that the calf preys on the cow, and that she wastes; not but that a cow may be fat in flesh, and very fit to kill, within three weeks or a month of her time; but in that case, withinside, and in her suet, she will be much impaired; — and one in the company added, her flesh, though fat, would not in that case spend so well; to which William Sartain agreed, and said, undoubtedly it would not eat so juicy as the flesh of a cow but half gone.

Of cows
overlaying
themselves.

§. 28. In January (anno 1700) I was displeased to see the damage the farmer's hogs did me, in roading about, and told him, I would have them penned up in his foddering-yard. — My dame replied, if so she must sell them; for they must not come into the foddering-yard amongst the beasts; I asked her why; she said, it would endanger the cows, being big with calf, overlaying themselves; for, said she, the hogs would nuzzel, and make
holes

C O W S and C A L V E S.

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holes in the straw, and the cows lying down in such hollows might die before morning, because they could not rise. — The farmer said it was very true. — And I observed, that tho' no pigs came there, they took care every night to lay the straw smooth. I spoke of it afterwards to Mr. Edwards, and he was well apprized of the truth of it.

If a cow be tied up in the house, great care ought to be taken, when her calving time draws near, to watch her by day and by night, lest her calf should be drowned; for, the cow's head being tied to the rack, she cannot turn back to lick the calf; besides she may calve in her dung, and so the calf may be smothered.

§. 29. If a young heifer be pretty forward with calf, that is, ready to come the beginning of July, and grass should be like to be plenty that year, it may sometimes do well to let her go on, and calve; she may pay better to the dairy than to sell to the butcher; but, in case it should be like to be a scarce summer for grass, she must be heightened up in fat as fast as may be, and be sold to the butcher; otherwise she may lose all her keeping; for she will fall away when she comes near calving, and, in case she calves, she may yield no more than what she cost when bought in. — When a cow begins to come pretty forward with calf, her teats will be turgent, and spring forth.

Mr. Cherry of Shotbroke's bailiff informs me, that to let a cow keep company with other cows, after she has flunk her calf, will be apt to make some of the others flink also.

§. 30. It is dangerous trusting to milk a cow all the year that has warped, for she will be in danger of warping again: sometimes one may venture to milk on a very good young heifer, but it is generally very unsafe. It is generally best not to milk such a cow; for that will keep her very poor, and unfit to

Manage-
ment of a
heifer with
calf.

Of a cow's
flinking.

Not to milk
a cow that
has warped

to sell to the grazier; whereas, by letting her dry up, she will be in the better case, and sell the better, and pay more than she would by milking.

Of cows
warping,
and going
through.

§. 31. Mr. Godwin of Gloucestershire told me in January, anno 1698, — that he had had ill luck this year in his cows; for three had warped, and one gone through. The calves, he said, were squatted, and one of their heads had a hole beaten into it, which he judged to have been done by his cow that went through; for it seems, it is the nature of a cow that goes through to desire a bull once every three weeks after, and she will then be riding the other cows, which another cow that has warped, or gone through, will like very well, but the cows with calf will slip away, and step with their hinder quarters aside from such a cow's leaping them, and then it often happens, that such a cow's knees fall against the side or flank of the cow with calf, and so squat the calf.

Stephens of Pomeroy being present agreed to the above; and said, that he never had but one cow that warped in his life, and the reason why he had been so successful, he believed, was, because he never had a cow go through. — It seems, the desire in a cow that goes through for a bull every three weeks generally lasts about twenty-four hours, but sometimes it holds three days, during which time. Mr. Godwin said, if he observed it, he tied her up. I asked Stephens, if he knew what made a cow apt to go through; he said, he was satisfied it was for the most part from hence; if a cow should come too early with calf, that is, before the husbandman would have her so to be, and consequently should be desirous very early to be bulled again, the husbandman will balk that desire two or three times, that his cow may fall with calf at a more seasonable time than otherwise she would have done: after such balks it is odds, said he, but, when she takes bull, she goes

goes through : and there is oftentimes a young heifer, that (in the year the farmer first desires she should take bull, and the first time of the heifer's desiring it in that year) when she shall be brought to the bull, will be very skittish, and will not stand to be bulled; in that case, said he, 'for fear of the foresaid danger, I have taken the heifer by the nose, and held her till she was served.—But, said Godwin to Stephens, in case a cow be subject to go through, do you know how to prevent it? Stephens said, after such a cow has taken bull, to bleed her well in the tail is the best thing I know of.

If a cow casts her calf, you must let part of her bag that will hang down behind continue so till it rots off; for if you pull it off, you will be apt, with it, to pull away what you ought not.—If you have a cow, that either warps her calf three months before her time (for if she warps but a month before her time, she may give milk never the worse for it) or goes through on her bulling, never proving big with calf, discretion must be used, whether you may milk her on, or fat her; and this ought to be, according as the cow is like to prove well for the pail or not.—The dairymen think the aforesaid bag that hangs down, the other cows smelling to it, is apt to make them warp also, as well as the warped cows riding the others.

They count a cow's warping her calf a month before her time not to be so bad as an ewe's losing her lamb; for the calf when first weaned cannot be valued at above half a crown, and it robs afterwards more butter and cheese than quits costs; whereas, a lamb will yield a crown after it has sucked milk that otherwise would never have turned to any account.

A neighbour of mine had three cows that flunk their calves, and yet he could find no hurt in the cows, nor could imagine the meaning of it; a little

C O W S and C A L V E S.

time after paying a visit to Mr. Dark of Beckington in Wilts, and speaking of the accident, Mr. Dark asked him, whether he had not rid some ponds or ditches that year, and spread the soil of them about; he said, he had; why then, said Mr. Dark, I have often heard say, that will cause the cows to sink. This seemed strange, but mentioning it afterwards to some of his workmen, they agreed, that they had before heard such a saying.

I asked Mr. Hawkins, an experienced grazier, if a three-year old heifer, that had warped early, as suppose about January or February, would make sound beef; he said, not so good as one older would do, but she would tallow the better for having warped so early. — I suppose a barren beast, for the same reason, will do so too.

Cows apt
to die in
calving in
July—
Caution—
to keep
them from
much wa-
ter.

§. 32, Mr. Bissy said, it was very common, at this time of the year, about July, for a cow to die in calving.—I asked, for what reason; he said, at this time of the year their calving over-heated them, and, tho' they were like to do well, they must be kept from cold water, of which at this time they would be apt to drink a great quantity, and would die thereon presently after;—and, when they are suffered to drink, they ought to have hay given them before they drink.—I asked him, if drinking when they calved was no dangerous in the spring; he replied, the cow was not then so thirsty as to drink to harm herself; however, he took great care then to give them hay before he gave them water.

Caution—
to give
cows warm
water, and
but little at
a time,
when calv-
ing in June
or July.

§. 33. June the 12th (anno 1718) I walked out on Oxen-leafe grounds in Wilts, with my tenants Tomkins, and farmer William Sartain, to see Tomkins's cattle; there was a cow that had not then calved, but Tomkins expected her to calve every day; she was a fine large cow, and in mighty case, for she was pretty good beef: farmer Sartain said to Tomkins, he must have his eye to that cow when she

she calved, and not let her have water for twenty-four hours after she had calved, and when he did give her some, he must see that she drank but a little, and that it was warmed.—I asked why that care must be taken; he said, when cows calve in summer, or hot and warm weather, there must be greater care taken of them than when they calve in the spring; for their bodies in hot weather will in calving be heated, and in that case the cow will be very craving after cold water, on drinking of which she will take chill and die; therefore in such case it is usual to drive such a cow to the house as soon as she has calved, and not let her drink soon, and when she does, but sparingly, and of warm water, for about two days; and this cow, said he, being in high case, will have the more need of such regimen; for she will in hot weather heat herself so much the more in calving.—I talked with farmer Chivers of Gausfuns about it next day,—who said all this was true, and that his next neighbour lost a cow a fortnight ago for want of such care.

§. 34. It is commonly said, that a bull-calf, as well as a pur-lamb, comes a week earlier than the females. Of a bull-calf.

§. 35. Sir Ambrose Phillipp's dairy-maid was advising with the butcher what she should do with a cow that fell off of her milk, and her milk grew very salt: no hurt was visible in the cow, nor had she got any cold.—I asked him, if either of those things would have occasioned it; he said, yes; he had known either to have been the cause of it, and particularly, when the late cold (anno 1699) so universally seized the horses, the cows at Loughborough shared in it, and they fell off of their milk, and it turned salt, and this was in June, and the farmers supposed the milk would not come well again till the cow had had a calf. Of cow's milk turning salt.

To dry up a
cow's milk.

§. 36. A butcher of Whitchurch in Hampshire, being with me, took notice of an old cow so forward with calf in June (anno 1702) as to be within a month, the cow being also in good case; he said, it was a pity, and advised however to dry up her udder as soon after she had calved as the calf was a fortnight old.—He said, when we went about it, we should anoint the udder with tar, but not the teats, and half milk her two or three times before we let her go dry; he assured me, this was the method of the Somersetshire graziers,---and tar is a cooler, and dispeller of tumours.

In Derbyshire, as some farmers of that country assured me, if a cow's milk does not dry up well after the cow is turned to fattening, by reason of the plenty of grass, and punishes her, they give her a pint of verjuice at two or three days distance, which effectually does it.

Of milk,
milking,
&c.

§. 37. Being in company with Mr. Bishop, and farmer Ryalls of Dorsetshire, we fell into discourse about milch-cattle, &c. Mr. Bishop allowed me, that milk of cows was thicker in winter than in summer, but had not so much cream in it, but much of the substance of the milk cruddled on the top; that the milk, whilst the cow was with calf, inclined towards bitterness and saltness.—He and Ryalls did agree, that, if cows were low in case, and eat only straw, they would not give good milk, till they calved, but it would fall to raggedness six or eight weeks before their calving-time; but, if the cows were in good case, and had good hay, they might give tolerable good milk till they calved; however they thought it was not adviseable, in either case, to milk them within two months or ten weeks of their calving; for that it did most certainly impoverish both cow and calf much more than the value of the milk came to, nor would the cow come in so early and forward in the spring for her

her milk; they also agreed, that, whilst creatures were young, as lambs and calves, they should be well kept, and they would shift the better for it ever after; for such a calf would, they said, come in a year the sooner for the pail; and they agreed, that, though Mr. Bishop sent his hog-lambs into Somersetshire for rich pasture from Michaelmas to Lady-day, and paid half a crown a-piece for keeping them, yet he was paid double fold for it.

In the months of May and June, say Mr. Bissy and Mr. Pain of Wilts, a cow, in our good pastures, ought to pay 3 s. per week in her milk, which rearing a calf till five or six weeks old will not do, so that about that time our butchers kill the calves at a fortnight old, mere carrion; for such calves will not pay us above 2 s. per week.

§. 38. Mr. Maserly was saying, it was agreed on all hands, that an heifer's calf was much better for rearing for breed than a cow's calf.—I replied it was so, but I was at a loss for what reason it should be so;—he said, he supposed, the only reason could be, because the heifer could not be milked at the time she went with calf, which robbing the calf in the cow's belly must needs do the calf a great prejudice.

An heifer's calf better for rearing than a cow's calf.

§. 39. My ox-hind, who manages my ox-ploughs, and was for many years a farmer himself in the north-west of Wiltshire, says, according to his experience, and the experience of other farmers of his country, the latter fallen calves, as suppose in May and June, are never so hardy afterwards when they are cows, nor will they bear the winter so well when they are cows as those reared from calves which fell at the latter end of February, or the beginning of March.—It seems to me that the reason for this must be, because the latter fallen calves must consequently be weaned late, suppose, about August, and calves always pitch, and fall away on their first weaning, and then winter comes

Latter fallen calves not so hardy when cows as early fallen ones.

on such late-weaned calves before they have recovered their strength; and again, such calves not being so well established in their vigor and stamina vitæ, nor having had that share of the summer-sun which early calves have, never do arrive to that strength, in their cords, and ligatures, and solids, as the early weaned calves do, and consequently, being also when cows of a more tender nature, do suffer more in winter, nor can they well bear the hardships of it as the others can. — He affirms farther, that such late weaned calves when they come to be cows, will never shed their winter-coat so soon, by a considerable time, as the early weaned calves will,---and indeed this is very true; for I have now, being in the month of June (anno 1712) a yearling calf, which, though he fell in June, and, being a very fine one, I kept him, and let him run with the cows all the winter, and he out-grew the calves that fell in March, yet pretty much of his russet winter-hairs are still on his back; whereas the coats of the early weaned calves are sleek and smooth. — He adds farther, that cows in a fair, in May or June, that have not shed all their winter-coats, are, in his country, as much concluded by knowing farmers to have been late fallen calves, as if they had seen them calved;---nevertheless I am sensible the occasion of this may also often be from the poverty, and hard winter's-keeping of the cows. — I have now also three cows of my own breed, which have not yet (though the latter end of June) kindly and perfectly shed their winter-coats, and yet are very well in flesh, which I believe to be from the aforesaid reason; for though I do not certainly know that they were late calved, yet, because of the coldness of our situation, and the scarcity of grass and hay in the spring, we are forced to contrive the bulling of our cows so, that the calves may fall pretty late.---It is certain, that the earliest breed
of

of the spring, of all kinds, are most valued, and the farmers find the above said account in them, as for instance, in colts, pigs, and lambs; the earliest are the most valuable, and to be endeavoured for, if the place will admit of it, and there be fit provisions for them. — School-boys, by experience taught, greatly prefer the singing birds hatched in March to those that come later, and it may be questioned, whether the early births of the spring may not have a special influence in regard to the vigor and strength of mankind, but that the soul of man, and the affections thereof, and the strange artful mixtures of food, under infinite noxious varieties interposing, exercise so vast and immediate dominion over health, and in the well or ill disposing the constituent parts of our bodies, that it is difficult to make the observation thereof; yet some little better judgment might be made in the wilder part of the Indies, where the savages conform themselves more to the methods of mere animal life: I should think the setting out on the race with the sun, even in the last case, cannot but give some advantage. — Note, from hence it seems to me reasonable, when we go to fairs early in the spring to buy barren beasts for fattening, to buy those that are sleekest, i. e. have nearest lost their winter-coats, because it seems they will thrive fastest.

I have taken notice, that calves late calved do not shed their coats so early in the spring, when they come to be cows, as those cows do that were reared from calves calved early in the spring, and being willing to know the opinion of some of the notable dairy-men about Holt, I found most of them had made the same observation.----Thomas Miles added, that such late-calved calves generally carried thick hides, and the reason he gave for it was, because the cows, which calve about May, are by that time got into good flesh and heart, and

so nourish their calves the better ; for which reason their hides are thicker.—Farmer Chivers said, that, when such cattle were not forward in shedding their coats, it was a sign, that their strength of nature was backward, and their blood cold, for that cattle's blood in the winter, when they were out of proof, if they were let blood, was sensibly to the hand colder than in the spring, and colder in April than in May.

Note, there is, on the approaching spring, a certain degree of proof requisite to give activity to the blood to go to the extremities of the capillary vessels, in order to form new roots of young hairs, till which be done, the old ones still continue their roots, and are not expelled.

Of giving
calves hay
at their first
weaning.

§. 40. Farmer William Sartain says, about them in Wiltshire the farmers geld the bull-calves at a month old, and then, in a week, or at farthest a fortnight's time, after they have recovered their being daunted by gelding, they wean them from the cows by giving them some locks of the sweetest hay they can get, in some convenient place, where there is an outlet to grass; and that the calves will delight to brouse on the hay more than the grass; and this they make them to do for a fortnight before they turn them wholly to grass.--- I asked him for what reason they gave such calves hay at their first weaning; he said, to dry up the water in them, and to harden their bodies; otherwise, if they were at first turned wholly to grass, it would be apt to scour them too much at first, and make them pitch. — But farmer Chivers said, on fat ground, such as Gausuns, they only wean the calves that fell about Candlemas at six weeks old, in order to their taking bull the next year, and then there is no grass, yet they do very well on hay alone.

Of wean-
ing calves.

§. 41. An experienced dairy-man in Somersetshire tells me, if you rear a calf, he rather approves of
of

of weaning him at six or seven days old, which may be done by warming the skimmed milk for him, into which if you dip your finger, and put it into his mouth, he will suck, and then, if you put a little bundle of hay, and give it into his mouth, he will suck that, and so, if the hay be put into the pail, and his head thrust to it, he will suck the bundle of hay in the milk, till he has drank it all up.— He says, he observes the calves weaned thus early to grow better, and make larger cattle than those weaned at seven or eight weeks old; for then they will pitch very much upon their weaning: however this way is very good, when the cows are poor; for the milking of them will not draw them half so low as the calves sucking will do.

Another, of great note in the same country, agreed, it was best to wean a calf early from the cow by giving him the milk out of the pail; for then he might run with the cows all summer; whereas, if he was suffered to suck the cow till he was five or six weeks old, he would be apt to suck her again after being weaned, especially if the cow be any thing fond.

A new dairy-maid of mine (anno 1706) desired she might wean my calves at two or three days old, as soon as they could have drawn down the beestings; for she said, they would not be so apt to suck one another: ——— I note this the rather, because we used before to keep them long with the cow, and they used to suck one another.

Being in the Isle of Wight (in August, anno 1708) I asked my tenant farmer Farthing and his wife (that farm depending much on breeding cattle, and consequently in weaning calves) how they weaned calves; for some years I had found ill success in trusting to the servants weaning of calves; some of them by ill and sour diet, for want of their keeping them troughs sweet, grew lousy; others fell into diseases

diseases by being over-fed ; I found by them, that, amongst other things, they gave a rule to their servants, in the measure of feeding, in this manner, viz. they ordered every calf to be fed by it's self, in a bucket, by a prescribed quantity ; viz. they gave three pints to a calf on it's first weaning, and advanced it gradually, as the calf grew, to five pints, as the calf was able to take it, before being turned grazier for itself, and this was the largest quantity they ever gave one calf in a day.—They fed every calf at a separate bucket ; for they found many inconveniencies in feeding them together ; some calves having a greater stomach, or being quicker feeders than others, would eat too much, and the slower feeders would suffer, and have too little.

I had a mind to know dame Farthing's opinion of weaning the calves by letting them run with the cows rather than suckling them by hand : she said, if they took their weaning by running with the cows, they would not be so gentle, nor stand so well to the pail, as the others.

Farmer Stephens, farmer Box, and all the farmers at Holt agree, that it is a very good way to give weaned calves, when first turned out to grass, skimmed milk, morning and evening, in troughs, for some time, but say, in their country they cannot afford it, because of making cheese of the skimmed milk, and their hogs must have the whey.

Being at Holt the 23d of May (anno 1719) I went to Pomeroy, where farmer Stephens had a calf of but a month old, which he intended then to turn to grass.—I asked him, if he was not too young to eat grass, and live on it, he said, no ; they would take their weaning as early as that, but calves usually fell so early in the year, that there was no grass, but at this time of the year there is grass and leaves every where for them to pick on, upon which account they might now as well wean a calf at
a month

a month old, as in March at six or seven weeks old.

If in weaning calves the grafs be apt to scour them, putting a little falt in their milk will be a means to put a stop to it.

§. 42. I saw two half-yearling calves of mine in December (anno 1701) fucking one another for a long time together; two Gloucestershire yeomen being with me, they said, that tar must be put to their teats, to prevent it; for otherwise in their country they look on it, that such calves will, when cows, get a trick of fucking themselves or each other. Of calves fucking each other.

§. 43. In taking a view of my lambs to see if they were meat for the butcher, my shepherd caught a fat lamb by the tail, for which a butcher of Whitchurch chid him; but the prejudice thereby I knew not, till my butcher the market-day after told me I had spoiled a calf by halling him by the tail, whereby his kidneys were very red, and his loins strained, by which his thriving was spoiled; he said it was the worst thing that could be done to a calf at his fucking-time to hall him about by the tail, or any other creature whatsoever, for the reasons abovesaid. Damage from pulling a calf or lamb by the tail.

§. 44. In Hertfordshire and Essex the calves coops are set so that the sun may come as little at them as can be. From J. Mortimer, Esq; F. R. S. fo. 169. Of calves coops.

§. 45. If calves and lambs cannot be well supported for the two first months in a kind way of fatting, it is hard to make them fat, but they being stunted at first will be pot-bellied. Calves stunted.

§. 46. Farmer Stephens of Pomeroy in Wilts tells me, (September 1712) it is now the practice of the butchers all over the country to buy the calves, or agree for them as soon as weaned, and to come when they are about nine days old, and bleed them in Of bleeding cows.

in the neck, taking the quantity of about half a pint, and to come three or four days after, and bleed them again the same quantity, and a third time the butcher comes three or four days after that, and bleeds them a pint. Note, he is sure a pint is the least quantity they take from them the last bleeding; he rather believes it is a quart.

Mr. Perdue of Winchester has had good skill in fattening calves, and the butchers would prefer a calf of his beyond any others.—He says, he used, according as his calf was lusty, at about a fortnight old to take from him about a pint of blood, and about a fortnight after another pint; he used to bleed them in the neck-vein;—he says, he placed their pens so hollow from the ground that their piss might run through and off, but never used to remove their litter, but every day give them a sprinkling of fresh wheat-straw over their old bed; by this means, said he, the calf lies clean and dry, and much warmer than otherwise it would do, for, said he, a calf can't lie too warm, and the heat of the dung fermenting under the straw, will much contribute to warmth.

Of milk
and bean-
flour to fat-
ten calves
and whiten
veal.

§. 47. The method of the housewives in Leicestershire, if a cow gives but little milk, so that the calf is not well maintained, is to scald bean-flour and put it into the milk: giving them this milk very hot, they think much contributes to the whitening the veal, as the bean-flour does to the fattening: you must give it them hotter and hotter by degrees, at first lukewarm, till at length they will be able to drink it as hot as you can endure your finger in it.

A cow-calf
may be kil-
led older
than a bull-
calf.

§. 48. I was commending the goodness of my veal to a great dairy-man, and said it was of a calf two months old. Then, answered he, the calf must be a cow-calf, for otherwise it would eat strong at that age; the case is the same with a sucking-pig: a sow-pig will eat well at a month old, but a boar-pig at that age will eat strong.

Diseases in COWS and CALVES. 125

§. 49. Sir Ambrose Phillips's keeper says, that ^{No white} veal cannot be white till after a calf be a month old; ^{veal of a} for till that time a calf does not begin to be white in ^{calf less} his flesh. ^{than a} month old.

§. 50. If yearlings or calves are so well provided ^{Time of} in winter-time with rowet, which they can come at, ^{foddering} that they need be foddered but once in the day, ^{calves in} that time had best be early in the morning; because ^{the winter.} there is usually a hoar-rime on the grass, till the sun rises to melt it, whereas the rest of the day the feeding on the rowet is very good till evening.

Diseases in COWS and CALVES.

§. 1. **M**R. Smith of Deadhouse in Wilts, walk- ^{A moist} ing with me at Gausuns, a poor wo- ^{nose a sign} man came forth, and asked him, what he thought ^{of cattle's} of a cow she believed was ill; he said, he thought ^{being well.} the cow was not ill, because her nose was moist, and that, if a cow or a beast be ill, that moisture presently dries up; Mr. Bissy said, so it was observed also in the yellows, and red-water, which, it seems, are only a higher degree of the black water.

§. 2. I asked Mr. Clerk of Leicestershire, whe- ^{Of bleed-} ther he used to let his beasts blood that he bought ^{ing cattle} in for grazing; he answered, it was not only a safe ^{before} way, but they would also thereby thrive the better; he said, if oxen bought in had been hard worked, or cows hard drove, it was very proper to let out their corrupt blood, if it was only upon that account, after they had been a week or a fortnight settled to grass; besides, as to other cattle, it was very well to bleed them when they first came into proof, lest they should overflow with blood: it is, he said, the same also with horses.

§. 3. I met Mr. Putchin, a great grazier, and ^{Of the} country-fellow, who lamented he had lost a cow of ^{murmain.} the

the murrain : we fell into discourse about the murrain, and they both agreed, that in such a case it was very necessary to bury the beast that died presently upon the spot, by digging a hole for it close thereto, and to drive beasts away out of the ground; and keep them from smelling to it, for, whilst it was above ground, they would be apt, if they could come at it, to smell to a dead beast; and, to prevent the rest from having the distemper, they rubbed their nostrils with tar, and daubed an egg over with tar and thrust it down their throats.—Sir Ambrose Phillipps's shepherd agreed to all this, only said, he blooded them also.

Of the joint
murrain, or

§. 4. In the month of November (anno 1707) I lost two calves by putting them into young fresh broad-clover that was gross, and of this year's stubble. — They call the distemper the joint-murrain. — Farmer Munday, who lives by Aldern-Mead, Hants, says, it is common for calves to die so in the vale, — but it is not so on our hills. — The calves must be bled in the jugular vein, a pint of blood, and be drenched with it, with a handful of salt mixed with the blood.

Quarter-
evil.

The joint-murrain in calves, mentioned above in 1707, I find by others is called the quarter-evil; I find by farmer Stephens of Pomeroy, it falls on yearlings and two yearlings at spring, and autumn, that is, October, and it seems to me to be owing to the quick rising of grass at those seasons, especially where, through the goodness or the moisture of the ground, it grows faster than the sun can concoct its juices, which chill and coagulate the blood in those cattle, and occasion a settled jelly in the neck, shoulder, or loins. The said farmer approves the medicine above prescribed, but says, he has found by experience, that an egg-shell filled with tar, and minced rue, and with a stick thrust down the throat (with

(with blood-letting) is the best remedy ; he says, to prevent this mischief, he has always found it best to let the yearlings and two-yearlings go with the cows, especially at such times of the year.—The reason for which I conceive to be, that the cows eat up the grosser grass, and thereby the calves feed the sweeter.—I find by him, that he never knew milch-kine to have the quarter-evil, for which this account, I think, may be given, viz. the morbidick matter is discharged by the cows with calf in the foulness of their urine.

§. 5. In discourse with my old shepherd, in July anno 1697, (who says, he has been a shepherd ever since he was ten years old) about the blain, he said, it fell on the cattle only in the spring of the year, and was over before the latter end of July ; it comes from a little red worm that the cattle lick up, of which he has seen many ; if it falls under the tongue, the beast may be cured, if it be taken in time, and the bladder occasioned by the bite be broken and rubbed with salt ; but if the blain-worm be broken in the mouth of the cow, and be swallowed, and goes into her guts, he knows no cure for it ; and yet, if the blain-worm be picked up by the cow, and swallowed whole, it will go through her, and do no harm. Mr. Edwards's servant tells me, he has seen two blain-worms in the bladder under a cow's tongue ; my shepherd says, he never knew it to fall under a sheep's tongue ; if they have it, it is by breaking the blain-worm, which being so swallowed he knows no cure for it.

On the 23d of March (anno 1705) I went down to Gaufuns, where I saw Chivers amongst his beasts ; he was saying, he could never stir from them at this time of the year ; for at the first spring of the grass their blood would suddenly rise, which is the blain, and a beast was soon lost ; and then he shewed me one which was growing bad. I asked him how he knew

Of the
blain. Vid.
Diseases in
sheep.

* of each
the same
quantity.

knew the rising of the blood ; he said, that a beast's eyes would run with water, and, before he dies, as the distemper rises, his eyes will swell, and his blood, when bled under the rump, will feel hot : in such case, said he, we give them the following drench ; a pennyworth of English liquorish, of English anniseed, of turmerick, of long pepper, of horse-spice or diapente * ana, ground all small, and just boiled up in a quart of strong beer ;—but, if by the heat of the blood one finds the distemper to proceed from a hot cause, then the horse-spice is to be omitted.---He says, though he has rented good lands, yet he never had land subject to the rise of blood before ; for it must be very quick growing ground, as indeed Gausuns was.---Mr. Bissy says, the bladder under the tongue in the blain will sometimes be as big as a pigeon's egg, and if they cannot find the bladder there to break it with their hand, they rake their bum-gut, and find it in their back.

Discourfing with a Devonshire yeoman on the diseases incident to cattle, and particularly the blain, he said there is a distemper that falls on a bullock in the spring, between April and June, occasioned by the overflowing of the blood, which they in their country call the bladder ; the bullock will be taken with a swelling of his lips, and running of his mouth, and swelling of his eyes, and running of them ; if it be discerned before he falls, he is cured by thrusting a pen-knife upwards, from the root of his ear, and bleeding him in that manner, and pulling out his tongue, and rubbing it with a little salt.

When I was at Mr. Cary's in Dorsetshire, Mr. Bishop told me for certain, and upon his own experience, in talking on the blain in cattle, that, if one run a bullock so distempered through the ear, near the root, with a knife, it would cure him, and

was

was the certainest remedy he knew of; he seemed very ignorant of such a thing as the blain-worm, but knew well in such cases, that a bladder arose under their tongues, and that many for the cure would rub the bladder with water and salt, and break it.---He thought there was no cure for the red-water in sheep; but said he had often had the fancy to rip up the skins of their bellies, and let out the water, and sew them up again; he said the hog-sheep were most troubled with it. Red-water

§. 6. They have in Wilts a disease on their cows, which they call a hask, or husky cough; the cow will cough huskily, and seem not to be able to bring up any thing, and loll out her tongue; this distemper seldom falls on them in the summer, but at the beginning of spring, and on the yearlings and calves more than on the cows: the remedy is, to take a pint of lukewarm milk from the cow, and put into it a quarter of a pound of the fat of rusty bacon minced small, and give it the beast to drink; you may, if you will, put into it a little sallad oil; it will do the better, and keep the beast fasting two hours before and after. The hask,

§. 7. Notwithstanding the cow-kind chew the cud, yet they are subject to indigestion, as may appear from what I this day observed in some of mine (July 22) which having the night before broke out into some winter-vetches, which I was then cutting for winter-fodder for my sheep, eat plentifully of them, and the next night they scoured, and I observed in their dung the grain of the vetches whole, and in great quantity. Of indigestion.

§. 8. There is a distemper in cows called maw-bound; their maws will be so bound, that what they eat will not digest, or pass, and will grow so hard, that what has been taken out, when the cow has been dead, would endure kicking about without breaking; at the same time the cow will have

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a blackish watery looseness: the first symptom it generally discovers itself by is, the cow will be subject to coughing; it is cured easily at the beginning by giving them a purge of cream of tartar, aloes, &c. * Columella has taken notice of this indigestion in the cow-kind, and tells us the signs of it are frequent belchings, and noise of wind in the belly, cramps, loathing of food, heavy eyes, &c. and adds that if it be neglected, it is followed by worse symptoms, such as swellings, gripings in the guts, groans, restlessness, and frequent agitations of the head and tail.

The distemper in cows called the maw-bound, Mr. Clerk says, comes from a surfeit by being overheated by driving, or when a new cow is worried by others; he says, a cow will likewise sometimes be maw-bound by eating of sedges in the water. The cure is, to give her a quart of cream, just upon it's breaking, before it is turning to butter, viz. when it is oylish; he says, the calves will also sometimes be taken with a cough; the cure is, to boil a pound of bacon, and give them a quart of the liquor in the way of a drench; it will cure them after once taking.

Of scour-
ing.
See Dis-
eases in
sheep, §.
12.

§. 9. Farmer Way, and others said, that my tenant at Woodhouse would always sell a calf at a month old for twenty shillings, and his way was, as soon as the calf was calved, to boil a piece of the inside bark of oak as big as one's hand in milk, and give it to the calf to drink, and this at once taking would prevent the calf from scouring, though he

* In bove cruditatis signa sunt crebri ructus, ac ventris sonitus, fastidia cibi, nervorum intentio, hebetes oculi, propter quæ boe neque ruminat, neque linguâ se deterget. Si neglecta cruditas est, & inflatio ventris, & intestinorum major dolor insequitur, qui nec capere cibos finit, gemitus exprimit, locoque stare non patitur, sæpe decumbere, & agitare caput, caudamque crebrius agere. Colum. lib. 6. fol. 161.

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gave it never so much milk after ; whereas the danger of filling a calf's belly is of making it scour ; then he would boil barley-meal and chalk in milk, and put it into a trough to stand knee high, and the calves would be frequently licking it. — Note, chalk is binding and drying, which I conceive to be the true reason why it is given to calves, the binding quality preventing the flux, consequently nourishing and making fat, as likewise making the flesh white.

For the scouring of a horse, cow or sheep, take wheat-flour ; tie it up in a cloth, and boil it in a pot of water five or six hours ; then bake it in an oven with a batch of bread ; then take it out of the cloth, and keep it in a pot ; when you use it, take a quarter of a pound of it, and as much bole-armoniac beaten very well together, and a handful of bramble-leaves chopped small, and mix it with a pint and an half of cold spring-water, and so give it to a horse, and let him drink cold spring-water ; give it in milk to a cow.

A very good dairy-woman in Leicestershire assured me, she was positively confident on many and frequent trials, that if a calf has a lax or looseness, though never so great, giving it nine horse-beans to swallow morning and night, will certainly put a stop to it in once or twice taking ; she has tried other remedies without success, but never missed of success in this ; a mistress of her's who kept a great dairy, told her the secret, which at first she thought a jest.

§. 10. The following receipts for the red-water Red-water in cows and bullocks are frequently used amongst See red-water in sheep, §. the dairy-men in Leicestershire. — The best, — bleed first either in neck or tail : then make a good ^{13.} strong posset with spice, and give it blood-warm ; then take a penny-worth of aqua vitæ and a hat-crownfull of yarrow ; pound and strain all the virtue out, and put it to the aqua vitæ ; take a red wil-

low-stick and burn it to a coal: pound it small, and put it all together, and give it as soon as it can be got ready.—Another,—take of shepherds-purse, red-shank (that is, herb-robert) yarrow, knot-grass, of each alike, and shred them all together; then put them into a quart of milk, and heat it with a red-hot iron, and give it blood-warm.

For the red-water in a beast; take mouse-ear and herb-robert, of each an handful, the inner bark of a barbery tree a pretty quantity, but not so much as of either of the other two; chop them very small, and put thereto a quart of new milk; then make it as warm as milk from the cow, and give it with a drenching-horn to the beast in the morning, and keep him fasting one hour after, and, if the blood turn not the next day, give him another drench of the same, but no more; for if the second draught does not cure him, you must kill him, and eat the meat; for it is never the worse or unwholesome for that disease, and the longer you let him live the leaner he will be, and at last will die of himself.

Note, as to the red-water, and the above receipt, it is to be observed, the ingredients are easy to be had, and that mouse-ear is a great astringent, and excellent against the dysentery and watery humours, unde, says Mr. Ray, *ovium gregibus noxia censetur*. —The barbery in all it's parts has likewise the same virtues.

The wether in the reins.

§. 11. For the wether in the reins; — take two penny-worth of long pepper, and three spoonfuls of henbane seeds; beat them together, and mix therewith a pint of thin grounds of ale or beer; heat it blood-warm, and drench the beast, and then wind him up warm in hay.

Note, as to the wether in the reins in cattle, the henbane or the seed of it is excellent good against the gonorrhæa or muliebria profluvia. Vid. Ray, fol. 711.

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§. 12. For the wether that comes forth either before or after calving,—take anniseed and liquorish of each one ounce bruised, fennigrick a penny-worth bruised, the leaves of setwall, (i. e. valerian) and primrose-roots, of each an handful, picked, washed, shred, and then pounded; boil all in three pints of strong ale, or beer, till it is half wasted; then strain it, and divide it into two parts, and into one part of it put a piece of sweet butter, as big as an egg, and give it to the cow blood-warm, and keep her fasting an hour after, and the next day give her the other part of the drench blood-warm, with a piece of butter in it, as before; it is best to give it in the morning fasting, except there be need to do otherwise, and then the first part may be given at any time, as soon as it can be made;---and if it be after calving, and that the cow should heave much, then the wether must be thrust in, and sewed up to sticks with a strong awl and shoe-thread, and the beast be kept warm, and drink warm water for five or six days after.—If the wether hang out much, some use to burn dry bean-stalks, and with fresh hog's lard make the ashes up into balls, as big as great wall-nuts, and thrust one of them into the beast, in the midst of the wether, and when she heaves it again, put in another ball, and so till she is well.

In the above receipt, setwall or valerian is good against burstings, primrose-root is very restraining, & cohibendo alvi profluvio magnopere confert, ventriculū atque aded̄ universa intestina soluta roborat, & fœno-græcum, secundum veteres, fœminarum malis plurimum subvenit. Ray. Bole armoniac is very astringent, good against the diarrhæa and dysentery, and menstrua profluvia.

§. 13. Sir Ambrose Phillipps's shepherd said, that their beasts were never troubled with the yellows, but that the beasts in some other places in the neighbourhood, where the feeding was very gross and

The yellows.

fat,

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fat, were subject to it; so that he supposes rich feeding may be the chief cause of that distemper:---he thought bleeding was the best way to prevent it.

A gentleman in Worcestershire told me, January 1696, that his cows had the last summer been very subject to the yellows; --- I asked him, if they were dangerous; he said, they often died of them.---I again inquired, how they appeared; he said, the whites of their eyes would look very yellow, their stomachs fail, nor would their food prove them; their udders will swell, and their milk fall away, and look yellowish; he said, if it fell on their back and loins, it was not easily cured, but if it fell on their udders, it might be cured by letting blood and drenching, and, if it were taken betimes, blood-letting only might do.---An hour after a farmer came in, and agreed to this, saying that he knew not what the yellows on the back and loins were.

A certain farmer said (in July anno 1701) that a cow of his had lately had the yellows, and the first coming of them to be known was by her milk being wheyish, and in rags, before such time as her udder looked yellow; he said farther, the remedy he uses, is, to bleed the cow presently, and then to take hot embers, and milk some of the cow's milk into them, and rub her udder therewith at evening milking-time for two or three evenings;---he says, the cure by hot embers has been by experience very well approved of. In this distemper, if a cow has not a speedy remedy, she often loses a teat, and sometimes her udder.

The black-
legs or
wood-evil.

§. 14. They have a distemper in Leicestershire frequent among the calves, which in that country they call the black-legs; but Mr. Glenn, who lives at Utoxester in Staffordshire, calls it the wood-evil. It seems it is a white jelly, and sometimes a bloody jelly settling in their legs, from whence it
has

has it's name of black-legs, and often in the neck between the skin and flesh, which will make them carry their necks awry. — I find by Sir Ambrose Phillipp's shepherd, it is of the same nature with the wood-evil in sheep, which, he says, are also so affected, and so properly may be called the wood-evil; and, like the sheep, if it falls in the calves joints, they overcome it, but if in their bowels, they die, nor is there any cure.

V. Diseases
in sheep.

§. 15. Farmer Stephens says, for the hassacks in calves he takes thin slices of the very * raftiest fat bacon he can get, and shreds it into small diamond-cuts, and then makes milk blood-warm, and puts as much of the shred rafty bacon into it as will answer the quantity of bread usually put into milk, and of this milk and rafty bacon he usually gives two horns to each calf, which cures them without fail, when they have been so bad as to loll out their tongues; he says, the quantity of milk you may give to each calf may be three quarters of a pint.--- Farmer Chivers says, for this distemper he gives two or three balls, as big as chefnuts, of an equal quantity of butter, tar, and rue chopped small, and puts them down the calf's throat beyond the quilt.-- Farmer John Sartain says, it is looked on that hassacks often come on calves by their feeding on drier grafs than ordinary, or by reason of their wanting water.---This might be the main occasion of it in the calves I brought out of Wiltshire, because my grafs was drier than that, and, though they had plenty of water, yet it might be such they did not like so well as what they had been used to in the vale, calves being nice; and drought seems likely enough to be the cause of it, both in respect to food, or want of water, because it is generally agreed that the broufing on wood will give calves the hassack.,

The haf-
sacks.
* rustiest.

Mr. Beach says, he has stood by and seen his father and his tenants give the following drench to

their calves for the haffaeks, viz. take about three quarters of a pint of milk, and heat it blood-warm, and put to it two spoonfuls of fallad oil, when the milk is thus blood-warm, and give the said quantity to each calf; it will be about two hornfuls.

The pipp. §. 16. If a calf takes the teat into it's mouth, and refuses to suck, suspect the barbes under the tongue, almost in the manner of the pipp, which you may take away gently, &c.---Maison rustique.

Oat-hulls in oxen's eyes. §. 17. I saw an ox's eye almost out, as I thought; three farmers standing by said, it was only an oat-hull, which among the fodder would frequently get into their eyes; powder of sugar or ginger blown into their eyes would, they agreed, cure them.

Of greafe in the heels. §. 18. I saw (in August 1699) one of Sir Ambrose Phillipps's cows with a bunch and swelling in the outside of either hind-leg, and I asked the cause of it. His dairy-maid and the shepherd said, that the cow being in high case when she calved about Michaelmas was two years, heated herself in calving, and cold weather coming upon her, she took cold, and the greafe fell into her heels, but she was never the worse; it was only an eye-fore.

The loore or sore between the claws. V. the loore in sheep, §. 16. §. 19. Farmer Elford of Upcurn in Dorsetshire tells me, cows will be so sore between their claws that they cannot stand, and will pine upon it; this he and others informed me, in that country was called the loore, and they agreed, that a hair-rope rubbed between their claws till the place bled would cure them; but Elford adds, that what will speed the cure is, to take verdigreafe and lard, and mix them together, and anoint the place: this he uses to do, and had it as a great secret from a cow-doctor.

Discourfing with old Wilkins, a notable farmer of Hathern in Leicestershire, he and another creditable husbandman agreed, that the fowle or loore in sheep's feet came from their going in wet ground, and

and was increased by the long grass and rushes which got between their claws, the pasture-sheep being most troubled with it, but it seldom afflicted the folded sheep: he said, bleeding a cow troubled with it on each side the claws, would, at the beginning, before it was too far gone, cure it without doing more: but then it was, he said, a common saying, that you must cut up the turf she bled on, and carry it, and hang it up in a hedge, and, as the turf grows rotten, the claw will grow well: but, said he, the meaning of cutting up the turf and carrying it away, is, because, if the fresh blood of a cow lies on the ground, [the whole herd will come and smell to it, and fly about the ground, and fall foul on, and push one another, and spoil one another: for which reason, if a cow be bled in the tail for the worm in the tail, they always staunch and dry up the blood in the wound perfectly well, before they turn her out to the herd, otherwise they would smell at her, and push her, and one another.

§. 20. Being in May (anno 1712) in company Tail-soak-
with Chivers, Stephens, &c. and having lately had a ^{ed.}
cow tail-soaked, or with a worm in her tail (as before noted) I was desirous to discourse on that subject with them, and I found they all well knew the distemper, and had it amongst their cattle: they agreed, that, though it sometimes fell on cattle in good case, yet it more generally afflicted poor cattle.—They did not seem to observe, as Mr. Hayes, a gentleman farmer, whom I had before consulted on this distemper, had done, that a cow which had once had it, was more liable to it afterwards than another cow.—I asked them, whether they had ever seen a real live worm in the tail; Chivers only in the company pretended to have seen such a thing, and said, he once saw a long narrow fleshy string, like a thread, cut out, it was of a red colour, and moved: they all agreed that the cow could not rise up in such a case;
and

and that the cure was to slit the tail where it was soft, and with a rag to bind in salt, rusty bacon, foot and garlick beaten together, and one of the company added rue ; but the tail must not be bound too hard, nor continue bound above a week, lest the cow should lose the brush of her tail : they say, in such a distemper a cow's teeth will be very loose : it seems, cows teeth are always in their best health somewhat loose, if you thrust them inwards with your thumb ; mens teeth will also be loose under ill habits of body.—Note, it seems to me, that both the medicine of oil of turpentine rubbed in, as mentioned in another place, and this medicine, act their cure by heating the marrow of the cow's back and loins, with which the spine of the cow's tail has a communication, for the disease seems to lie in the back, and that the tail indisposed alone could not in such manner affect a cow as to weaken her to the degree above related.

Speaking farther of this distemper to a Dorsetshire farmer, he told me, they call it the worm in the tail ; the joint of the tail near the rump will, as it were, rot away, and the teeth of the cow grow loose, and her stomach fall off, so that it will in a very little while sink the stoutest cow or bullock, tho' it seldom falls on a bullock in good case, but generally on cattle when they are poor. — The cure is, to cut a deep gash into the fore, at the rump, and rub a handful of salt into it, and so bind it up with a rag.—Again talking of it to farmer Ryalls, he agreed to what the other had said, only he added, they mixed foot and a clove of garlick with the salt, and that the tail must be well and carefully cut, or else the kine might be in danger of losing their tails ; he says, though they call it the worm in the tail, there is no worm there, but he takes it to arise from the blood, when the blood runs high.

The D A I R Y.

§. 1. **S**O much cleanness in scalding relates to a dairy, that Chivers of Wiltshire averred (farmer Sartain being present, and consenting thereto) that the dairy-farms spent as much wood in fire, to that end, in summer, as they burned for other purposes in winter. Of cleanliness in the dairy.

If the milk-vessels are not kept clean, they will be sour, and the cheese will be sour before it can come, and will eat sour and choaky.

§. 2. Chivers took notice how a cool dairy was a great means towards preserving the cream the longer from turning sour; said he, my milk-house is too small for so great a dairy as mine is, for the milk coming in hot, the steam of it heats the air of the room. Of coolness.

§. 3. My next neighbour had a calf penned up, and the cow grazed in a ground by it, and the cow being kept from her calf, and yet able to come up near to the pen, grew unlucky to pigs that were routing in a dunghill near, and gored one of them in the eye, whereupon she and her calf were turned out together, but then the cow would not give down her milk to them that milked her. — I asked the farmer's wife, a notable dame, the reason of it. She said, when the calf was penned up, and the cow was brought to it, when they milked her, the calf was hungry, and would suck hard, and the cow would give down her milk to the calf, and then the maid also might milk her, but when the calf was turned abroad with the cow all day, when the maid came to milk her, the calf not being hungry, the cow would hold her milk up from the maid: and so, she said, other cows were apt to do. Of cows not giving down their milk.

A gentleman farmer of Gloucestershire told me, (anno 1698) that he had a cow of six years old that had

The D A I R Y.

had usually given good milk, but the last year she would hold up her milk, and would not give any, and he knew not what should be the reason of it.— A farmer coming in, I asked him his opinion about it. It is odds, said he, but somebody has ill milked her; for if one milks such a cow by halves, that is, to step away, and come again, or to keep talking and milk her in a very slow manner, the cow's patience will be tired, and so she will get that trick.

How many
cows a wo-
man may
milk in an
hour, &c.

§. 4. I asked farmer Clerk of Holt in Wilts, how many cows a very good dairy-maid might be able to milk in an hour; he said, and they present all agreed, that it was a good hour's work in their country, where the cows gave a great deal of milk, to milk six in an hour; he said, he thought his wife could milk as fast, and with as much strength as any body could, and she could once he believed have milked eight, but she was not able, though of but a middle age, to do so now: farmer Chivers, and farmer Stephens agreed to this. — They also said, when cows began to give off their milk, they would, if not milked clean, soon grow dry. — I put the question, when it was that the cows began to give off the height of their milk; they agreed, that they began to abate about the time of the blossoming of the wheat, and so on, till a good aftermass came, and then for a little while their milk would increase again, but cold and rainy weather in the autumn will dash the cows, and then their milk will abate again. — I take the reason why the cows milk abates about wheat-blossoming time, to be, because about that time the grass of the field blossoms also, and the flush of the sap is come to it's height and maturity, and then abates; for the roots of the grass at that time begin to harden and grow dry, nor do they take in the juices of the earth so freely as they did before, and so grow drier and drier till the seed is hardened; which seed being so brought to maturity,

riety, the roots of the grafs for ſome time, till the cold and winter checks them, ſtrike freſh ſap-roots or buds preparative to the enſuing ſpring, and which will the next year be the ſpring-roots and increaſe ; on theſe new efforts or eſſays, as aforeſaid, in autumn, after the ſeed of the grafs is perfected, depends the ſtart of the autumn-graſs till the cold checks it, which we call the aftermaſs, and from whence the cows milk ſomewhat increaſes.

§. 5. Good houſewives may know whether cows are well milked or not ; for if the quantity of milk does not yield ſo much cream as it ſhould do, were the cows milked dry, then they may be aſſured that the cows ſtroakings are not milked away, for, if the ſtroakings are left behind, much the greater portion of cream in proportion is left in the udder ; becauſe the wateriſh part of the cream comes away firſt, and the fatteſt at laſt ; for they, being the laſt of the cow's milking, lie up higher in the udder ; and conſequently are more digeſted and concocted by the internal heat of the cow's belly.

§. 6. Sir Ambroſe Phillipps had a cow which, when milked, gave blood with her hinder teat ; and the dairy-maid endeavoured, as I obſerved myſelf, with great pains to milk that teat ; and after ſqueezing with all the power ſhe could, there would come forth a ſtring of coagulated blood two or three inches long, which being removed, the like would follow three or four times together, and then there would come forth milk from that teat, as at other times, though much diſtained with blood : the cow all the while would endure the milking, only when the maid ſtroaked the upper part of the udder behind, to bring down the bloody matter, her hurt being conceived to be there, ſhe would not endure it ; this held for near three weeks.—And it ſeems they had known the like before : it was ſuppoſed another cow had run her horn againſt the bag of the udder behind,

How to know when cows have been well milked.

Of a cow's udder that has been bruised.

hind, and bruised it, and they anointed the udder behind only; all the rest of the teats gave good milk.—It seems, if a lazy maid, who would not have taken so much pains with the teat, had had the managing of the cow, the bloody milk having had no vent, would have spoiled the udder.

Of a cow's
udder
growing
hard after
calving.

§. 7. Sometimes a cow's udder will be hobbled after she has calved, that is, will be very hard like a board; the cow will not give down her milk well, and her udder will afterwards quarne, that is, grow knotty; in such case, till her udder is come into order, her calf ought not to be taken from her, because she will not give down her milk so kindly to the hand as she will to the calf, and thereby her udder will be apt to grow sore, and break as womens breasts do.

Of hill and
vale-coun-
try cows.
See §. 27.
Of cheese.

§. 8. Mr. Whistler observed, that the hill-country cows milk did not yield so much cream to the same quantity of milk as the vale-cows milk will do. — But surely this must proceed from the poverty of the hill-country cows, they being generally poor in case; your thin necked and bodied cows, that are washy and flue, are observed to give a great deal, though but thin milk: but seeing our beef and mutton, when fat, eats as sweet as any in the world, I cannot conceive why the milk of our cows, if they were in as high case as the vale-cows generally are, should not yield as much cream as their cows milk does.

I have heard it observed by some farmers and dairy-women, that cows with yellow horns, or with thick necks, give generally very good creamy milk, and that cows with thin necks are generally remarked to be flue cows, that is, cows that will not thrive with their meat; and these will give a great quantity of milk, but it will be of a blue or grey colour, and will yield but little cream. A cow, they say, should not be milked within about ten weeks of her calving,

calving, for though she will give good milk to the very day of calving, yet the calf will be thereby starved. A cow should be milked very clean, or her milk will dry away.

§. 9. Farmer Moseley of the Isle of Wight, and ^{Profit of a} his wife, being at Crux-Easton (anno 1698) they ^{cow.} gave me the following account of a dairy; viz. that 45 s. per cow rent, was counted a good price in the island, that formerly it used not to yield so much, but upon the rise of butter and cheese, it now fetches as above: take one cow with another in the island, if they give two gallons of milk per day it is well; which will yield four pound of butter per week; and from June to Michaelmas, if a cow yields 70 lb. of butter to be potted, which comes to 23 s. 4d.—and an hundred weight of skim-milk cheese at three half-pence per lb. that is 14 s. per hundred, it is what is commonly expected; besides which, there is the May-butter, for in the island they begin not to pot till June: then it is said, a cow's whey will maintain a pig; but, said he, it will not; the calf, also may be valued at sixteen shillings.

§. 10. In case the first milk, which they call the ^{Of taking} beestings, be not taken away clean from the cow, ^{away the} upon her first calving, it will go near to make the ^{beestings.} cow's milk to dry away.

§. 11. The Roman writers on husbandry forbid- ^{Of giving} ding the colastra or beestings to be given to the calf, ^{the beest-} as if it was a poison, I asked farmer Stephens about ^{tings to a} it, he being in his way a notable observer, and milk- ^{calf:} ing a great part of his dairy-cows with his own hand: he said, at first he did let the calves suck the beestings, and found no inconveniency in it, but, said he, I have very often observed, when a cow has warped her calf, and we have put a calf of ten days or a fortnight old to draw down the udder (which is better done by a calf than by hand, because the cow is apt to hold up her milk when milked) that a calf of that

that age has been much purged by the beeftings, and received a great deal of harm thereby; and therefore he held that the beeftings might surfeit, and had better be drawn off; it ftands to reafon, if one faw what a curdled body they are of.

Of thunder
breaking
cream.

§. 12. Thunder will fo break the cream, and turn the milk in the milk-pans, that no cream can be skimmed up for butter; nor will the curd for cheefe hold together, but will break afunder.

Of a quart
of cream
making a
pound of
butter.

§. 13. Though it be commonly faid, that a quart of cream will produce a pound of butter; this muft be underftood of a quart of cream that has fettled two or three days, for three pints of cream juft skimmed from the milk will yield in three days little better than a quart. If you bring in the milk and ftain it prefently into the pans, without letting it ftand to cool before you ftain it, there will be much the lefs cream.

Beft butter
and cheefe
made after
June. Vid.
149. Of
cheefe.

§. 14. Farmer Elford, of Chubbs, near Up- cern, Dorfet, fays, he reckons the beft butter and cheefe to be made after June; and whatever may be faid of May-butter or cheefe, he thinks it not fo good by much as that made afterwards; and his reafon is, that though the grafs comes on thick in May, yet the cattle muft likewise get into heart before they can give abundance of milk, or that that is very good.

Of fald
cream for
butter.

§. 15. I am informed, that throughout Devon- fhire they make their butter in a different manner than elfewhere; for they fet the milk over the fire in many brafs pans to warm in, which makes the cream rife, and when a bladder riles in the middle they take it off the fire, and take off the cream, and put it into a tub, and it then looks like a clouted cream; then a maid only by putting in her arm and ftirring it, brings it to butter prefently, which is very rich butter, but the cheefe that is made

made of the skim-milk is very poor and has little goodness in it.

§. 16. It is agreed by the dairy-men about Holt, ^{Butter} that against peas and beans time ^{dearer a-}grass-butter rises in ^{bout peas} its price by reason of its consumption on those le- ^{and beans}gumens, therefore good housewives collect butter a ^{time.} month before that season, and salt and pot it.

§. 17. I have heard that a young heifer's maw ^{Of rennet.} that has never been with calf makes better rennet, and is better for cheese than a calf's maw.

§. 18. I find by the conversation of Chivers, ^{The richer} John Sartain, and many other judicious dairy-men ^{the pasture} about Holt, that cheese made between hay and ^{the longer} grass is apt to heave, (i. e. when the cattle eat of ^{the cheese} hay and grass, as in the beginning of the spring) ^{must be} and is a stronger sort of cheese than grass-cheese, ^{kept.} and therefore is not fit to be sent to market under a year old, because till then it will not be mild: in a word, I find by all the information I can get, that the richer the ground is (as it is with the strongest beer) the cheese of it must be kept the longer before it is ripe, so as to eat mild and palatable, and then none will eat better.

§. 19. I am informed by farmer Stephens, my ^{Of cheese.} tenant at Pomeroy in Wilts, who is the most experienced man in all things relating to a dairy that ever I met with; first, that if milk be sour, the cheese thereof will always eat * chocky, and never ^{* Dry,} eat fat, though there be never so much cream put ^{chalky.} into it, which is the reason why Cheddar-cheese often eats so, being made so large, that they keep their milk collecting too long; such cheese in toasting will burn and bladder, a sure sign it is not fat.—Secondly, such cheese (to shew it is dry and not fat, notwithstanding a great deal of cream be put into it) will in its coat on the milk-house shelves look white and dry, and never gather a blue coat: neither will cheese over-salted ever gather a blue coat,

but in toasting burn at the fire, though never so much cream be put into it, and will look white and dry in it's coat.

In Somersetshire and Wiltshire.

§. 20. Being with Stephens about East-Lydford near Somerton in Somersetshire, and having there business with a great many farmers, I found by Stephens and the confession of those farmers, that notwithstanding their lands were much richer than those of North-Wiltshire, they could not pretend to make such good cheese as was made in North-Wiltshire, and that the North-Wiltshire cheese of the same sort would out-sell the Somersetshire cheese by three shillings or four shillings in the hundred weight. — It was allowed also, that the Somersetshire women could not make a cheese with a yellow coat like those of North-Wiltshire; wherefore the Somersetshire women, to disguise it, put saunders into their milk, to give a yellow colour to the coat of their cheese, which giving also a yellow colour to the inside, when people put in the taster, they find the art, and upon discovery take exceptions, for the inside of the North-Wiltshire cheese is white. — And it was confessed by all, and agreed, that down farther westward, tho' the lands were better, yet the cheese was worse than in those parts of Somersetshire I speak of. — This allowed of difference between the North-Wiltshire and Somersetshire cheese gave me many speculations into the reasons for it, and I asked them present about it. — Stephens above-mentioned would have it, that in Somersetshire they were not so good housewives as in North-Wiltshire, nor would he give any other reason, notwithstanding I had said, if the difference consisted in art, intermarriages would soon rectify that mischief, and a farmer that is choice in the breed of his bull and his cow, and goes far for them, would also send for the best dairy-maid in the country of North-Wiltshire; for the difference
he

he speaks of amounted to at least twenty pounds in two hundred pounds rent per annum, and it was not to be conceived a whole county would be so stupid as to suffer such a loss, when the North-Wiltshire parts, wherein he lived, were but twenty-four miles distant from those parts of Somersetshire I was then in.—They allowed also at Winchester fair, if the fair was dull, the Somersetshire men must stay a day the longer before they could sell.—I cannot give a reason for this, unless the following be one, viz. Somersetshire lying low and wet, though the grounds are very rich, the juices of the grass are from thence less spirituous, and less concocted and digested, more gross and gnash, and consequently the cheese wants the virtue of that from the North-Wiltshire grounds, where though the grass may grow slower, yet the watery juices are more rectified and qualified: therefore all this, if it be true, must depend on these suppositions;—First, that dry grounds, by reason of poverty, afford no rich juices, and consequently no good cheese, for we must not say, because North-Wiltshire being drier than Somersetshire outdoes it in cheese, therefore the hill-country in Hampshire being drier than North-Wiltshire has better cheese, for the contrary is evident.—Secondly, that there is a medium in the watery temperature of the earth, either extremum of which viliorates the juice, where there is not an equal heat of the sun or fatness in the earth to correct the juices of the superluxuriant grass.

§. 21. This spring (anno 1720) was throughout In North- a cold and very wet spring, and the summer was Wiltshire the greater wet and showery till July the 18th, and a great burden of hay and grass there was in North-Wiltshire, the plenty of cheese, unless in the water-meads, where they were stranded, the dearer it sells. however cheese bore a great price, viz. twenty-four shillings per hundred, for that first made in the spring; and the tenants of Holt who were going

with their cheese to Maudlin fair at Winchester, which is on the 22d of July, expected a higher price: the reason of which was this; the last summer was so very dry, and the winter-meat, both hay and straw, fell so very short, that the generality of cows were much pinched, so that the cows about Holt gave but little more milk or cheese this wet summer than they did the summer before. Again, it is generally noted, that in North-Wiltshire when they make most cheese, they sell it dearest, and when the least, they sell it cheapest; the reason is, in wet springs and summers, the generality of North-Wiltshire not lying low and wet, as Somersetshire does, in those years they make most cheese there, whereas the land of Somersetshire, and Lincolnshire, and the deep lands of England, lie all the spring and summer under water, or so much in a poach, that the grass is chilled, and cannot grow; but in the North-Wiltshire summers it is the direct contrary: then in cold wet summers the first cheese-fair of our parts, which is Maudlin-hill fair, carries the best price of all the later fairs, as falling before the Somersetshire cheese can come to a fair.

Of the blue
coat or vin-
now on a
cheese.

§. 22. Stephens having before made it one of the characters of a good cheese to carry a blue coat on it, or a vinnow: I asked him whether it were good housewifery to wipe that off. He said, there were two sorts of vinnow on cheese, one in the nature of mouldiness, or long downy vinnow, not blue, which proceeded from the moisture of the air and weather, especially towards winter, and such vinnow cannot be too often wiped off; and, if neglected, it will eat into the cheese, and give it a bitterish taste within the coat; whereas the blueish vinnow he spoke of proceeded from the inward sweat of the cheese, and would come on the cheese in dry weather as well as moist.

§. 23. Of the three sorts of cheese, viz. the hay^{Of three} cheese made some time after the cows calving, the^{sorts of} spring-grass cheese made in May and June, and the^{cheese.} afterma's cheese, though the afterma's cheese be the heaviest, and but tasteless, yet it is the fattest of the three, and, if it be kept to a good age, is a singular good cheese; for then the cows milk has the most cream: the hay cheese, if the cattle feed on good hay, will cast as yellow a colour on the coat as any, and being made in the spring, will have a very hard and smooth coat, having the spring to dry it in; it is a very good cheese, and very profitable in a family, being very tart on the tongue, and will go very far in spending.

§. 24. Being at Pomeroy in Wilts to taste cheese^{Of after-} in the beginning of November, (anno 1714) Stephens^{ma's cheese} having sold his cheese made in the spring, had only the early afterma's cheese fit for spending left; but he and his wife assured me, such cheese was fatter and mellowier than the cheese made in April, May, and June, though the spring-made cheese was tarter. I asked them how the afterma's cheese could be termed the fattest, when certainly the grass in May and June was richer than in July, August, and September.—They said, they supposed the reason to be, because the cows about April having brought calves, which were not weaned from them till about the beginning of May, the cows were low in flesh and condition, having had little grass to support them till then, and when the flush of grass comes in May, it is true they give a great deal of milk, but not so much cream in proportion, nor so fat milk as in the afterma's season, when the cows being got into good heart, and flesh, they better concoct and digest the juices of the grass with those of their own bodies.—So from thence, said I, it must follow, that a poor cow must always give thinner milk than a cow in good flesh. Again, I suppose on his reason depends in some measure the tartness

of the cheefe made in the spring, becaufe the cows have not then good juices in their own bodies to qualify and mellow the acrimony of the juices of the grafs, nor has the sun had time to concoct the juices of the grafs, which are therefore eager and tart.

Broad-clover will not make good cheefe.

§. 25. Mrs. Biffy the elder of Holt assures me, that broad-clover will not make good cheefe; for it will taste strong and bitter, yet they have not found it to heave: she also says, that neither the milk nor the butter taste well.

A cheefe-loft, should be high and cool.

§. 26. It is agreed by the dairy-men in Wiltshire, that the higher in the ceiling a milk-house is, and the less heat underneath, as from cattle in a stable, &c. so much the better for a cheefe-loft; for heat makes cheefe heave, especially if the land it be made from be rich.

Where cows give the least milk, the milk has more cream in proportion to the quantity.

* Vid. §. 8.

§. 27. When farmer Sartain and farmer Stephens were making remarks how the cows of Gausins exceeded those of Pomeroy in milk, yet they agreed that no cheefe exceeded that of Pomeroy, and that those dairies, where the cows give so much milk, did not make the richest cheefe; for, said they, where the cows give the least milk, the milk has more cream in proportion to the quantity.—* But this seems to be contrary to a former observation: and farmer Sartain said, this I know by the farm at Holt, for when I lived there, none made better cheefe than I did, though I rented only the arable and poor grounds.—Upon which I objected soon after to farmer Sartain and farmer Chivers, how then it came to pass, that poor ground would not make rich butter? to which Chivers replied, that doubtless it would; that is, said he, if you should have a sufficient large dairy, and milk enough to make butter every day, or every other day at farthest; for then the cream being sweet, the butter would be sweet and rich also; whereas poor and small dairies churn but twice a week, and then, the cream

cream being turned, or upon turning, the butter cannot be good. And the cream of sour and coarse grafs, such as mine is at Crux-Easton, will sooner turn sour in proportion to the sourness of the grafs.

§. 28. September 5th (anno 1712) being at Holt in Wiltshire, I encouraged my tenant Stephens of Pomeroy to come to Crux-Easton in Hampshire at Michaelmas to sell his spring-cheese; viz. that made in May: and he seemed inclinable to do so.—Of which design of his I acquainted farmer Chivers the next day.—Chivers smiled and said, he thought Stephens would be wiser than to go so far at that time of the year to sell his best spring-cheese; for, said he, such cheese does not likely meet with the best price till towards Candlemas, when the aftermas cheese is spent, for in autumn and about Michaelmas there is such abundance of soft aftermas cheese to be sold, and the poorer sort of dairy-men pour it so fast into the market, as also their spring cheese (for then these dairy-men's harvest is over) that the spring-cheese will rise afterwards in it's value, like hard-keeping pippins, which yield double the price at Christmas that they would in autumn, when the country was full of all sorts of summer-apples, the great plenty of which summer-fruit depreciates for some time the price of the hard-keeping fruit: and in like manner, when the corn-harvest is just in, so many farmers occasions for money being to be answered, the best corn will not generally come to the best market till the glut is over, and the barns grow empty. I grant, said farmer Chivers, the latter made or aftermas cheese we must all properly sell, whether poor or rich, because though the aftermas cheese be in truth as fat as the spring cheese, yet it is a heavy deadish cheese, and will grow tough or glewish by keeping,

Spring-
cheese rises
in price to-
wards Can-
dlemas.

whereas there is no occasion for felling the spring-cheefe, unless for want of money, because that will grow mellow and gain spirits by age.

In Wiltshire when wheat is dear, cheefe is dear, and why.

§. 29. Mr. Raymond told me (in June anno 1709) it was always observed about them, at Puckshipton in Wiltshire, about two miles from Patny, that when wheat was dear, cheefe was dear also, which seemed strange to him; because, said he, it was a wet and cold spring that made wheat dear, and then we have always the greatest plenty of grafs, which one would think should make plenty of cheefe.—I replied according to a former observation, the reason was plain to me, because the country where he lived, and Pewsy in his neighbourhood, lay on warm sands, which land, and the hill-country of Wiltshire within two miles of him, bore great burdens of grafs, as he said, in wet and cold springs; but, said I, the deep and low lands of England, such as Somersetshire, &c. &c. which sort of lands set the price to cheefe as well as wheat, miserably fall short of a crop of grafs in cold and wet springs, as I told him I was but then newly an eye-witness of, for I came then from East-Lydford in Somersetshire to him, being June 19th, and the grounds of that country had not then got a good bite of grafs, by reason of the cold wet spring, nor had they been able to fat cattle in time.

Hill-country land improper for a dairy.

§. 30. Our hill-country land is so much the more improper for a dairy, because our foddering season holds so very long, and is so tedious, by means of our rowet-grafs falling off a month sooner than their's in the vale, and the spring grafs coming a month later; so that the cows must needs be in a low condition at spring.

As I have taken notice that the clover is four in cold lands, so doubtless the butter and cheefe must partake of it's nature more or less, as the clover may

may be sourer or sweeter, which may reasonably be supposed to be the cause of the butter and cheese at Easton being strong and rank.*

S H E E P and L A M B S.

§. 1. **I**T is very necessary in inclosed farms, that, if the shepherd be not required to hedge at spare times, he should however be required to mend, for his business being much in walking about the grounds, he has the opportunity of seeing what is amiss. The shepherd to mend hedges.

§. 2. My shepherd assures me, that by my shepherd's cart I shall save the value of it this one year, (anno 1701); for, says he, it is impossible in this hill-country but broad-clover hay especially must be abundantly blown away by the wind, when it is carried by bundles at the shepherd's back; whereas the sides of the cart will preserve it from the wind. Benefit of a foddering cart.

§. 3. Having made some remarks on the small profit arising from a flock of sheep, I imparted the substance of it to a gentleman in my neighbourhood of long practice in husbandry; he said, that I was in the right of it, who lived in inclosures, but if he, where there was intercommoning, must buy new sheep yearly at spring, that were not used to shift for their living, in their bare commons they would be starved; they must therefore keep up a flock accustomed to the place.—Add to this, that the Advantage of keeping up a flock of sheep in open common fields.

* Among other useful inventions with which the reverend and learned Dr. Hales has obliged the world, he has published one to sweeten milk that has got an ill taste from the cows eating of crow-garlick, cabbage, turnips, autumnal leaves, &c. which he effects by volatilizing the rancid oil with heat, and, when heated, dissipating it by ventilation.—See his Account of the good effect of blowing showers of air up through milk, and also a plate of the instrument for performing it, printed for Richard Manby, in the Old-Bailey, near Ludgate-Hill, 1756.

winter-

winter-fold, by reason of the grass not being so sweet, and the frosts falling on it, is not so good as the summer-fold.

Best age
of an ewe
and sheep.

§. 4. Mr. Bishop of Dorsetshire his shepherd says, they generally reckon an ewe's third lamb to be the best; and they reckon a sheep to be at full growth and prime at four years old; though, he knew not, he said, but, if an ewe had great keeping, she might belly some time after that; some sheep would grow broken-mouthed at five or six years old, and others not till nine or ten: when they find an ewe a good motherly one, and to bring a good lamb, they keep her till she is broken-mouthed.

Of sheep's
teeth.

§. 5. Sheep at two years old have but two teeth, at three years old they have four teeth, at four years old six teeth.

OF BREEDING SHEEP.

Sheep from
a warm
country do
not thrive
on the hills.

§. 6. I bought about forty ewes out of Oxen-leafe in Wilts (anno 1718) where the ground is coarse, and they also fared hard; I brought them to Crux-Easton in October, where they had plenty of hop-clover; they seemed to do very well till December came, and then they crouded up under shelter of hedges, and ran into the lanes, and their wool being thin, and short, and more knotty than ours, they could not bear the cold of Crux-Easton well, nor keep the open fields in winter, nor could we hold them with the best hay, but they would pitch.—From hence quære, whether it be so good husbandry as is imagined, to mend our flock of sheep or cows by a fine wool-sheep or Gloucester-brown; since the produce carry such thin fine-grained hides, as may not prove so well on our cold hills.

§. 7. Sheep

S H E E P and L A M B S. 155

§. 7. Sheep without horns are counted the best sort : because so much of the nourishment doth not go into the horns. J. M. Esq; F. R. S. fol. 177.

Sheep without horns the best.

§. 8. I carried farmer Miles of Wiltshire to a field where I had some * couples fattening, I told him the ewes were leather-mouthed with thick lips. — He said, they were called with them hants-sheep; they were a sort of sheep that never shelled their teeth, but always had their lambs-teeth without shedding them, and thrusting out two broader in their room every year.—Being the next day at Mr. Raymond's, I had an opportunity of discoursing his shepherd, who said, he had been a shepherd thirty years; he knew the sheep by the same name, and said, that now and then, in buying a parcel of sheep two or three would creep into their flocks, but he never knew so many together as twenty, which at that time I had : he said their teeth would not hold them so long as other sheep, but would wear down to a thickness by reason of their biting on them from lambs, so they ought to be fatted a year the sooner. Mr. Raymond being by said, there were such a sort of horses called by the name of hants-horses, that always shewed themselves to be six years old.

Of leather-mouthed or hants-sheep. *Ewes and lambs.

My shepherd bought me a score of couples ; when he brought them home he said, they must be fatted, for they would not live in our flock, but would be starved : they were a small sort of sheep, and out of case. I wondered at it, and asked him how that could be. He said, they were thick leather-mouthed cattle, of which sort there were many in Wiltshire and Berkshire, and therefore they could not bite so close as our sheep, if they went in the flock with them.

§. 9. Mr. Oxenbridge of Wilts says, he grew weary of sending his † hog-sheep from Michaelmas to Lady-day into Somersetshire ; for, though by that means he brought them home in high case, and

† Young sheep should be well kept.

and could maintain them so all the summer, yet he found they expected as good keeping the next winter, and for want of it would pitch, and not hold their flesh so well as those which had always continued on the farm.— I told farmer Ryalls, and Mr. Bishop's shepherd of this; they said, they were against sending hog-sheep abroad, if there was land to maintain them in the winter without pinching the flock; for, if the winter proved hard, they would often be cheated of their meat, and be neglected abroad: but a hog-sheep ought to be kept up well the first winter, to be brought into good bone and limb; for, if a * thief be not kept up well, and should pitch in yeaning-time, unless you take her lamb from her, and put it to an ewe, it is odds but you lose both thief and lamb; for it will bring the skenting or scouring upon her and kill her; and it is a very good way to put a thief's lamb to an ewe that has lost her lamb; for the ewe will maintain it well, and she is past improving, but the thief will thrive much the better for having the lamb taken from her.

* Young ewe of the 2d year, called also a two-teeth.

A free-martin sheep.

§. 10. Mr. Biffy says, an ewe-sheep that is a free-martin, besides the piffed stinking tail she carries, has a lesser and lanker bearing than other sheep.

Farmer Collins of the Isle of Wight assures me, there are free-martins in sheep both male and female; he has for a fancy sometimes kept one of each four or five years; he says, they will stink like a goat if you come near them, so that one can hardly bear the smell; and the female does not piss as other ewes do, but her piss comes dribbling from her, and the piss of the male runs dribbling down along his yard.

Of ewes not taking ram.

§. 11. Being at the fold with my shepherd, he pointed at an ewe, saying, what a fine ewe there is! her tail is apt to be so rough, and loaded with wool, that next ramming I will clip her; for, said he, I believe

that last year the ram could not ram her for that reason.—I observed indeed her buttocks to be wadded with wool. — That year (anno 1702) I had about thirty of my best ewes that went through and proved barren, which might be for the abovesaid reason ; for I keeping my sheep very well, they might by ramming-time carry too much wool on their buttocks : the year before I also had about twenty proved barren.

§. 12. Discourfing with a farmer in the Ifle of Wight about sheep, I faid, now (in November 1718) sheep being dear, an ewe-fold would pay better than a weather-fold becaufe of their increafe. —To which he replied, it was undoubtedly fo, in cafe the sheep went in inclofures, where one could give them their bellies full ; but in cafe they go on common downs or fields, then of neceffity one muft keep weathers, becaufe they can fare hardier than ewes, or elfe your neighbour's flock will ftarve your ewes.

§. 13. The ewes muft be well kept all the winter, and better than the weathers : a weather's wool is of much lefs value than the wool of an ewe, and will fcarce pay for his winter's keeping, but his tail in folding on the barley in fpring, when the ewes muft not be folded, will turn to better account. — Weathers among a flock of ewes will thrive better than by themfelves, becaufe they will beat off the ewes, and have the top of the grafs in fummer, and the beft of the hay in winter:

§. 14. In buying fheep for fattening at the firft hand of the year in fpring, one may be pretty fecure of buying in thofe that will thrive, inafmuch as fheep, which feem forward in cafe early in the fpring, muft be of a thriving fort, otherwife they could not be forward in flefh fo early : but for the fecond fattening it is not fo certain, forafmuch as fheep may be in good cafe at Midfummer, and yet have

have been a tedious while in arriving to that condition, and consequently will be so in their progression.

Of rubbing
sheep's
eyes with
salt.

§. 15. My neighbour's shepherd asked me, if I knew how to make rotten sheep sound ; on which I inquired of him, if he knew how to do it ; he said, to rub their eyes with salt would deceive the buyer, and make the whites of their eyes look curious and red ; that practice, said he, is common among the sheep-jobbers.—Afterwards I asked farmer Elton about it ; he said, he had heard that the sheep-jobbers did use it.

Of making
sheep to
appear like
folded
sheep.

§. 16. Sir Ambrose Phillipps's shearers said, it was a common cheat about them, to get reddish clay, and dissolve it in water, and colour the sheep with it, and two or three hours after, when it was dry, to card their wool on their backs, to make the buyers believe they had been folded-sheep, and not pasture-sheep ; for folding the sheep on the fallows gives their wool that reddish colour ; and in case the sheep were forest, or pasture-sheep, many would not buy them, because being not used to a fold, nor fallows, they would not be able to keep them in either, but they would break away.

Of lean
sheep be-
ing dear in
June 1707.

§. 17. Lean sheep fell well at this time (June 8, 1707) though the spring and summer-part of the year to the 22d of May (when rain fell) has been the driest in the memory of man ; I was at a loss for the reason of this whilst in Hampshire, which is a breeding country of sheep ; but when I came into Wiltshire, a grazing and fattening country, I soon saw the cause of the dearth of lean sheep : for it seems, a greater demand had been for their fat lambs for three years last past than ever was known, and greater droves of them carried to London, and when the ewe-lambs were fatted, the ewes were consequently fatted too, and this extraordinary consumption has wasted the breed of sheep, and consequently raised the price of lean weathers, but especially

cially of ewes.— In discourse afterwards with Mr. Biffy on this subject, he allowed there had been greater drifts of lambs sent to London for these three years last past than usual, the reason of which was the breed of sheep greatly increasing, because there had been no rot, which moved farmers to fat lambs, because sheep were like to be cheap; but, said he, the aforesaid reason is not the only one, why lean sheep are dear, but the drought is the chief reason, for no rain falling till the 22d of May, and dry weather following, graziers bought sheep, fearing they should not be able to fat greater cattle, grafs being so short, and the season of the year so late.

Being at the fold with my shepherd, I asked him, what ram-lamb he would save for a ram; he pointed at one, which he said was deep-woolled behind, and had broad buttocks.— That is true, said I, but yet I do not approve of him, because he is so wide-headed, that is, his horns stand so wide, which may endanger the ewes in yeanning by bringing such lambs of the breed, as I have often heard it observed by old experienced shepherds.— He admitted this to be a proper objection.

§. 18. At Loughborough Capt. Tate was saying, that he would buy him a Lincolnshire tupp to improve his flock.—Major Hartop was there, and bid him have a care that he was but of the lesser size, otherwise his ewes might die in yeanning, unless they were large sheep. The next day I met Mr. Clerk with captain Tate, and he said the same thing. We see it happens to little lap-bitches often, if lined with a great dog.

§. 19. * Palladius, Columella, and Pliny, speaking of the choice of a ram, direct us, not only to have

Marks of a proper or improper ram-lamb.

A large Lincolnshire tupp improper for small ewes.

Of the choice of a ram—from the antient writers.

* Cujus coloris sub linguâ habuere venas, ejus & lanicium est in fœtu, variumque, si plures fuere. Plin. lib. 8. cap. 47.—Non solum ea ratio est p. bandi arietis, si vellere candido vestitur, sed etiam

have a regard to the whiteness of his wool, but to his palate, and the veins under his tongue, for, if these are black or spotted, according to their notion, the lambs that proceed from him will have black or spotted fleeces.

• Other qualities required in a ram, as delivered by the antient writers, are these. His figure should be stately and tall, his belly big, swagging, and woolly, his forehead broad and well frizzled, his eyes of a hazel-grey, encircled thick with wool, his breast, shoulders, and buttocks broad, his tail very long and fleecy, his testicles huge, the ringlets of his horns circling inward. Not that a ram, says Columella, is more useful for having horns, for the best are those that have none, but because one of this kind is less * hurtful than those, whose horns are more open and extended: in climates however that are cold, wet, and subject to storms, we rather recommend the largest headed rams; for the greater and more spreading the horns, the more will their heads be covered and protected from the weather.

• Probably to the ewes in yeanning.

Of a ram, and the proportion of males to females.

§. 20. Mr. Bishop's shepherd said, that they reckoned a ram would serve thirty ewes, though they usually kept two or three rams over and above to their flock: they kept their rams well against ramming-time, but afterwards turned them out to

etiam palatum atque lingua concolor lanæ est; nam cum hæ corporis partes nigræ aut maculosæ sunt, pulla, vel etiam varia nascitur proles. Colum. lib. 7. cap. 3. Pallad. fol. 101.

* Sint fronte lanâ vestiti bene, ravis oculis lanâ opertis, auribus amplis, pectore & scapulis & clunibus latis. Varro, lib. 2. cap. 1.

Habitus autem maximè probatur, cum est altus atque procerus, ventre promisso atque lanato, caudâ longissimâ, densique velleris, fronte latâ, testibus amplis, intortis cornibus; non quia magis hic sit utilis (nam est melior mutilus aries) sed quia minimè nocent. Quibusdam tamen regionibus ubi cœli status uvidus, ventosusque est, arietes optaverimus vel amplissimis cornibus, quod ea porrecta altaque maximam partem capitis à tempestate defendant. Colum. lib. 7. cap. 3.

the

the hardest fare ; and if the ewes warped, they turned them out to the rams again, and they would bring lambs again about St. James's-tide. The above is a large proportion of rams to ewes, for a good ram will very well serve no less than sixty ewes.

Mr. Bishop said, he knew how not to be deceived in a fair by a ram that had his stones in his back, for a weather : for he had a thicker nose, and was ram-headed.

Jacob presented to his brother Esau 200 she-goats and 20 he-goats, 200 ewes and 20 rams, 40 kine and 10 bulls, Genesis, cap. xxxii. ver. 14 and 15.—Quære, whether that might not be the proportion of males allotted to females in those countries.

§. 21. Mr. Bachelour of Ashmonsworth is much for keeping the ram from the hog-sheep till they are two years old ; for, says he, they make the only sheep for our hill-country, but hog-sheep in our hill-country make very ill mothers, unless extraordinarily kept. Columella recommends an ewe of two years old. Elige ovem bimam.

Ewes in the hill country not to be put to the ram till two years old.

The farmers are apt to give their ewes they sell at St. Leonard's the ram at Bartholomew-tide, and early, that they may thrive on it before they come to the market.

§. 22. I was saying to farmer Lake of Faccomb, Hants, that I wondered how my rams could break out, and get to my ewes, and ram them, because we coupled them together, and kept them in close inclosures, and they must get out to the ewes, because twenty of them had lambed a little after Christmas.—The farmer said, I suspect some of your forward ram-lambs might ram them, they not being kept separated from the ewes, for such ram-lambs will ram the ewes ; I myself, said he, had forty so rammed : and those ram-lambs of yours,

Of ewes being rammed by ram lambs.

which were lambed at Christmās, will ram your ewes again, if not separated as soon as the rams are.

Colour of the lamb mark of the ewe's health.

§. 23. Farmer Ryalls of Dorsetshire walking with me in Mr. Bishop's ewe lease, he went up to a lamb not long lambed, that was of a yellowish hue, so coloured I suppose from the ewe : he said such a colour argued, that the ewe was in good heart and case, but if the lamb when lambed was of a greenish or blackish cast, or of a pale white, it was otherwise.

Mark of the good case of sheep.

§. 24. In walking he turned up some of the sheep's-dung, which was of an intire clot, with only one or two foldings in it : he said, and so did Mr. Bishop's shepherd who was with us, that it was a sign such sheep were in good case, and had their bellies full, whereas, if their dung came away in pellets it was otherwise.

Sign of an ewe's being near lambing.

§. 25. Cows and sheep will fall away, and look hollow in the flank, a day or two before they calve or lamb, as if they had done so : and cows will always pitch upon their rump, that is, have more hollowness there than any where else.

Of tailing the ewes.

§. 26. Tailing the ewes in the spring-time, that is, cutting away the wool from under their tails, and their udders, is very proper, especially in deep and fatting countries, where they fat their lambs, and do not fold : it keeps their udders sweet and free from chopping by the heat of their urine, so that the ewe may the better bear the lamb sucking her, for her udder being fore, she will not let the lamb suck, but will wean it ; and the sweeter her udder is, the better will the lamb like to suck it ; whereas otherwise the lamb will be apt to take to grafs, and wean itself, whereby a lamb intended for fatting will be prejudiced.

Of the care of ewes, and lambs.

§. 27. In lambing-season the hill-country shepherds have a hard time of it, being obliged to watch the ewes sometimes for a month together, every

every night of the week, lest they should be frozen to the ground : it is sometimes very troublesome to make the young ewes of a year old to take notice of their lambs : if ewes are not wintered well, they will never have good lambs, but rascally ones ; it is all in all to feed the ewes so, that they may bring good lambs.— Oftentimes they are forced to give the lambs milk, which if not boiled, will carry them off by a looseness.—The warmer part of the downy hill-country allow three tod and an half of hay to the wintering of one sheep, and suppose the half tod to answer the accidents of a severer winter than ordinary, but at Crux-Easton it is necessary five tod should be allowed to every sheep ; for the winter is longer at Crux-Easton than on most part of the downs, it lying under snow sometimes a fortnight, or a month together, when the other downs are free from it.

About lambing-time when they hurdle up the lambs new fallen in the mead at night, it is customary for them to go forth at midnight, and to stir up the ewes ; for some ewes will be so lazy as not to rise all night, and then their lambs will be almost starved by morning, whereas when they are thus raised, their lambs will have opportunity to suck.—By that means also a lamb may be saved, which the ewe could not lamb without help ; and sometimes a lamb will be saved, which was in danger of being lost, by getting out of the fold between the hurdles. The antients laid a great stress on the attendance and care of the shepherds at yeaning time, and Palladius advises to put the lamb to the teat as soon as

* *Pastor partus pecoris non secus ac obstetricum more custodire debet ; neque enim aliter hoc animal quam muliebris sexus enititur, sæpiusque laborat in partu.*—Columella, lib. 7. c. 3. — *Agnus statim natus uberibus maternis admovendus est : manu prius tamen exiguum lactis, in quo spissior est natura, mulgendum, quod pastores colostram vocant ; namque hoc agnis, nisi auferatur, nocebit.* Pallad. in calendar. Novem.

it is fallen, but to take the beefings from the ewe first, lest they should be hurtful to the lamb.

Of ewes taking ram §. 28. My ewes not lambing so fast after they had begun in March (anno 1702) as usually, I was speaking of it to my shepherd: he said, he believed it was, because we folded them late in the year, on the cold wheat-land, after it was sowed, which made them not take ram so fast.

Knotted sheep often breed from horned, &c. §. 29. Mr. Bishop says, he sees no difference between the horned and knotted sheep: if he sees a fine lamb of the knotted sheep he keeps him, though his flock be horned: he says, he has often a knotted lamb from the horned sheep, and a horned lamb is often bred from a knotted ewe;— and sometimes a black lamb from a white ewe and ram.

The first lamb generally pot-bellied §. 30. It is to be observed, that the first lamb an ewe brings is generally potted, that is, pot-bellied, short, and thick, which is not so good a lamb as the long straight-limbed lamb is; ⁴ the antients separated these from the rest of their flock, as being of a weak nature, and not so long-lived as those that came from older ewes.

Of cows milk for lambs. §. 31. It is adviseable to be provided with a cow with calf in winter, that the weak and sickly lambs may have milk in the spring; and the offall hay the sheep make will fodder her; but, if ewes are kind to their lambs, and have milk enough for them, it is better not to give them cows milk; for it does not agree with lambs so well as ewes milk, but is apt to scour them, for which reason they usually boil it.

Of recovering chilled lambs. §. 32. If a lamb, when first lambed, is overcome by the hardship of the weather, wrap it in a wisp of straw, and bring it to a hay-reeck, and it is still better if it be in a sheep-barn, where the sheep may go

⁴ *Oviculas ex primiparis natas abalienare oportet, cœdumini-
mè diuturnas.*—Didymus in *Geoponicis*, fol. 430. *Primiparis
minores fortus.* Plin. lib. 8. c. 47,

round it ; thrust the lamb into a warm hole of the reek, and in a day's time, if any thing will, it will recover the lamb, and then you must bring the ewe to it, that it may suck : the reek is much more suitable to the nature of the lamb than the fire-side.

§. 33. The main care to preserve lambs at yearling time, if snow should fall, is to bed them with straw. A young ewe will be shy of her lamb by reason of the tenderness of her udder : the young ewe, being forward, must be kept hurdled up for a day and a night, till she takes to her lamb, in the same manner as when a strange lamb is put to an old ewe. Of the care of lambs.

When Mr. Bishop's shepherd had tamed an ewe that he had tied up to a strange lamb, he used, when he let her out, to tie her hinder and her fore leg together with a string, that she might not run away from her lamb.

If an ewe warps her lamb before her time, or the lamb comes at it's full time, but in an ill condition, or dead, it seems improper, to me, to put a twin-lamb, or a thief's lamb to such an ewe ; for such an ewe's milk will not be kindly, nor will the lamb thrive ; but, if the lamb comes at full time and sound, though dead, or is afterwards killed by an accident, then such usage is very good, and I have done accordingly.

If any good ewe lose her lamb by a fox, or weasel, or other accident, the shepherd ought to set a thief's lamb or twin-lamb to her : the lamb's head to be wiped with the sheep's green tail, till brought to it's nature ; and

If there be no lamb in that flock to spare, a lamb ought to be sought in a neighbouring flock.

In lambing-time always put those ewes that brought twins apart by themselves ; because, if you let them go with the other ewes and lambs, they

are apt to lose one of their lambs, till they are a little settled with them.

* Palladius speaking of the ewes that have newly lambed, says, the lamb should be shut up with the ewe for two days.

Of wean-
ing lambs.

§. 34. As to weaning of lambs, in some places they never sever the lambs from the dams, especially in the best pastures, where the ram goes constantly with the ewes; because, when the ewe goes to ram again she will go dry, and wean her lamb herself; and in unsound pasture they reckon it best for lambs to run with their ewes, because they seldom rot while they suck, unless the ewe's milk fails. - J. Mortimer, Esq; F. R. S. fo. 179.

Of care in
catching a
lamb.

§. 35. The butcher coming to kill me a lamb, which I helped to catch, I held it up by the back to weigh it; and, when he had killed it, I observed the blood, where I had griped the lamb on the back, was already settled in a bruised manner, though killed immediately upon it. — He says, it neither hurts calf nor lamb to catch it by the hinder leg.

Of cutting
lambs.

§. 36. They used at Crux-Easton formerly to cut their tup-lambs early, within six weeks old; but of late (anno 1697) they have put it off to St. James's-tide, because they find the lambs, when so old before they are cut, carry a better head for it. — In Wiltshire they cut them at six weeks old. — The Wiltshire farmers judge it is hard to keep the wound from the flies, when cut so far on in the summer.

Id. and of
spots on
lambs
thighs.

Farmer Farthing of Applesford in the Isle of Wight, who had in April (anno 1700) newly cut his lambs, assured me, that several of the lambs would have under their legs, on their thighs, red spots in the flesh or skin, as big as the top of one's finger, and if they cut such lambs they would most certainly die in less than twelve hours; nay, said he,

* Per biduum natus cum matre claudatur. Palladius, fol. 118.

if such lambs be but slit in the ear or ear-marked, so as blood be drawn whilst they have those spots, they look on it that they will die: but three or four days after those spots appear they will go away, and then they may be cut: — he had half a score that he forbore cutting at that time for that reason.—He says, in the island they cut the lambs in the beginning of April at farthest, that they may cut them before these spots come forth, for they observe the spots to come forth when the hawthorn bushes begin to bud.—To all these points farmer Glyde did agree, and says farther, that, if they had no spots under their thighs, yet, if they were in their bodies, which was not to be seen, it was the same thing; for he had lost lambs, and when he had flead them, he saw the spots.—Farmer Farthing's shepherd caught me a lamb or two to shew me the spots, which were like a bloody scurvy-spot.

In the island they approve of cutting lambs and not of girding; because girding makes them not limb so well in their thighs, nor be fat there, when they come to be fatted.

When I discoursed my shepherd, and farmer Elton about the red spots under lambs thighs, and told them, in the island they all looked on it to be mortal to cut a lamb at that time, I asked whether they did not observe the same about them. I found they had heard something of it, but said, the method in their country was to sear, and if it be dexterously done, no blood will be drawn, nor do they regard whether they do it when the spots are on the lambs or not.

Sir Ambrose Phillipps's shepherd knew nothing of the red spots under lambs thighs, and yet cuts them about the beginning or middle of April; he observes not the sign, nor thinks it ought to be regarded, only he takes care not to cut them when the weather is too hot, nor in wet weather; for the wet

falling on their loins at that time, is apt to give them cold. — He says, it is a common opinion amongst them, that if a man cuts lambs who has a stinking breath, or that takes tobacco at the time, either of these will poison the place, and make it apt to gangrene. — An Irishman, coming to Sir Ambrose's to buy mares and rams in that country for breed, wondered to see the shepherd cut his lambs on a day when the wind was northerly, and said, they should in Ireland look on it to be certain death to the lamb, if cut on such a day.

Formerly the butchers used not to like searing, but would have the lambs be drawn because it hurt the leg of mutton, it never being full there, which was true as they then managed it; but of late we find searing to be the safer way, and to put the lamb to less pain than drawing, and we now prevent that mischief by searing as little of the cod away as possible.

The butchers assure me, that a pur or ram-lamb will never be so fat for the butcher as an ewe-lamb : they say, the pur-lambs I intend to fat should be drawn as soon as they are a fortnight old; they would fat much the better for it; and if I should keep them to be weathers, though they will not run so much to a head as those that are cut or drawn later, yet they make better mutton

June 3d (anno 1702) I cut my pur-lambs, the weather being very hot, and they seemed to my shepherd to do very well that night and all the next day, not being able to come to the pond to wet themselves; the third day they had the liberty of the pond, when he observed they would take the water, and even swim, they went in so deep: that week I lost six of them, which died of the rankling of the cutting: I had at the same time ten lambs cut, which went by themselves from the flock, being twin-lambs, but they could come at no water,
and

and these did very well.—Therefore it may be shrewdly suspected that the other lambs rankled from their running up so deep in the water, and that they should be kept from water, especially in hot weather, for three or four days after their being cut.—Mr. Edwards assures me, he has often heard that going into the water was very dangerous for new-cut lambs ;—but farmer Bond says, he keeps not his from water, nor has he found that it hurts them.

Mr. Biffy draws the stones both of his calves and his lambs himself with his teeth. I wondered at it, because it seemed at first, as if he thought touching the stones with the hand or an instrument might not succeed so well ; but he said, the only reason he knew of was, because by the help of his teeth one man could do two men's work ; for whilst he draws the stones with his teeth, he has his two hands at liberty to hold back the strings of the stones that they are not drawn away ; for the strings run up into the loins and back-bone, and if care be not taken to keep them back with both hands, the stones would draw the very cawl after them, and then the lambs must die ; therefore the way is to draw the stones leisurely with the teeth, that you may be sure to hold the strings from drawing after.

Mr. Bishop says, in Dorsetshire they cut not their lambs till the latter end of May. I asked him the reason of it. He said, they kept them the longer from cutting, that they may be able to fold on the barley-grounds, which they would not be, if they were cut in March : their great fair for pur-lambs at Sherbourn is in July.—They have three ways in Dorsetshire for cutting lambs ; by cutting and searing ; by swigging, which is girding them hard round the cods, and cutting the cod away close to the string ; they know whether it be well done or not by it's not bleeding afterwards ; and thirdly, drawing,

drawing, which is done by making a slit in the cod as wide as an half crown, and drawing out the stones, which will bring away with them a back string, and stuns the poor lamb for the time : if this way kills them it is in two or three days time, but in swigging they will die sometimes a month after : Mr. Bishop uses drawing, and says it is the best way : and so said another farmer.

About Holt they cut their lambs at a fortnight or three weeks old, though they should fall at Christmas : and then, says Isles and William Sartain, they will eat as sweet as the ewe-lambs : they take care to cut them in dry or frosty weather, and not in wet, and to keep them walking after it, and to raise them up three or four times, and keep them stirring that day they are cut.—Note, they all draw their lambs-stones with their teeth, which is the only way if you intend to fat them.— They say, it is so easy to do, that any one may do it.

They advise me to put my ewes to ram, in case I would fat my lambs, so as to come the latter end of January, or, considering the coldness of our country, in the middle of February.— William Sartain said at another time, that he scrupled not to draw the stones of his lambs at four or five days old, if they were come down, so as to take hold of them, and had commonly done it, but never lost any.

The north country, as Lincolnshire, and those counties that send their knot-headed lambs (i. e. not horned ones) to Smithfield market, (they being great lambs of large-sized sheep) do not send their lambs to London till about Midsummer, and hold on sending till about Bartholomew-tide; those lambs are coarse, especially the males, because they do not geld them, though they fat them, which makes them the larger ; for they agree, that gelding them makes them of less growth, though the meat is the sweeter for it.

§. 37. Mr. Clerk was telling me how they managed their lambs in Essex to sell them so fat in the London markets, as they do before Christmas; he says, they keep their ewes as high as ever they can, and house their lambs, and bring in the ewes to them at six in the evening for all night, and turn them out at six in the morning till nine, and then take them in again for some time, and turn them out till six.—But as soon as an ewe's lamb is fatted off, and sold, they keep such ewes to serve the lambs that are left; the ewes that feed all night are taken in in the morning about nine, and then the mother-ewes are not called in in the day-time: the foster-mothers are held whilst the lambs suck: all the time of fattening the lamb has its bed of straw changed once or twice in twenty-four hours, and a chalk-stone to lick on.

§. 38. Virgil seems to be wrapped up in his poetical spirit when he triumphs on the fruitfulness of Italy, and says,—“that the lands bear two crops in a year, and the ewes lamb twice.” By which he must mean, that the ewes so lamb twice in a year, as to bring up their lambs to a marketable condition, within the compass of the year, that is, so as to have taken their weaning, or be fit for the butcher; otherwise if he means, that their ewes bring lambs twice within the compass of the year without rearing them, he says no more than what is common throughout the world.—The *Rei rusticæ scriptores* say, “that when the ewe takes ram again, she will wean her lamb.” But it seems this expression of the *Rei rusticæ scriptores* is generally to be understood; and doubtless, according to the common condition of flocks, the ewes are not in so good case as to suckle one lamb and breed another, and therefore will, if with lamb again, wean the sucking lamb.—But it happened otherwise with farmer Stephens, my tenant, for he had three ewes that went in good pasture, which brought him lambs at Christmas, which

Of fattening
lambs in
Essex.

Of ewes
bringing
lambs
twice a
year.

which he sold fat to the butcher at Lady-day last (anno 1707) and at the beginning of June thinking his ewes to be mutton, for they looked big, he went to sell them to the butcher, who handled them, and found their udders spring with milk, and that they were near lambing, and accordingly did lamb the first week in June : and this his neighbours know to be true.—These ewes being well kept, did in this case, it is evident, take ram three months before they weaned their first lambs : and these ewes had always been used to bring twin-lambs, and so of a more fruitful sort, though in this case they brought but single ones.

I am informed from Dr. Sloan, that in Jamaica ewes bring forth twice in fifteen months, without any regard to the time of the year, but cows as in Europe.

Time
when
lambs, &c.
are eatable.

§. 39. When God demands the first-born of cattle for himself (Exod. xxii. 30.) he says, “ seven days it shall be with it’s dam, on the eighth day thou shalt give it to me.” On which Dr. Patrick remarks, “ that till then the young were not of a maturity, nor accounted wholsome.”—To which I must add, that they are not so by that time in our cold-country in England, where a fortnight is the soonest we think well of such creatures for eatables : but it is very reasonable to believe they were maturer in half that time in Judea ; for it is apparent to me, on experience, that sucking-pigs, and lambs, and calves, thrive much faster in England in the hot months of the summer, than they do in winter.

OF SHEARING SHEEP.

To let
sheep cool
before
they are
washed.

§. 40. Being on the 4th of June (anno 1701) to wash our sheep on the morrow, I asked my shepherd, what time in the morning he would drive them to the wash-mills ; he said, they should not
begin

begin washing perhaps till ten, but he would begin to drive them by five in the morning, or earlier, that the sheep might have time to cool after they came there, before they were washed, otherwise it might make them ill.

§. 41. Going along with my sheep to washing, my shepherd asked me, if I should in a week's time want to kill a fat sheep, because if I did, said he, I will not wash him; for the tumbling and rubbing the sheep damages the mutton, if killed so soon after, but it is never the worse for it in a fortnight's time.

§. 42. In Kent, near Hiam-kill-marsh-priest, about ten miles beyond Gravesend, they wash their sheep in the following manner; — there being creeks, that are muddy, when the tide is down, but, when the sea flows, are deep in water, they tie ropes to three or four sheep of the flock, and haul them over, the rest willingly following, and then the said sheep are drawn over again in the same manner, and by the time they have swam over seven or eight times, which is as often as they well can do in a tide, they will be well washed: — and this washing, they say, is preferable to our scouring and rubbing them: — from hence it appears the salt water is not pernicious to their wool.

§. 43. I asked Sir Ambrose Phillipps's shearers, if they did not reckon a slow-running water better to wash the sheep in than a quick-running stream, because it scoured better. — The shepherd said, he had heard it so reckoned, but he rather liked a sharp stream, for if it did not scour so well, yet it left not that oily smell behind it that the other was apt to do, which would invite flies to blow the wool between washing and shearing. — The shearers said, — they believed they could not wash their sheep so clean as we could at Crux-Easton, because their sheep went much

much on a sandy soil, and the grit of that would not wash out so well as the clay.

Of shearing
sheep's tails
in the Isle
of Wight
and Hert-
fordshire.

§. 44. Coming over Appleford-common in the Isle of Wight, I observed the tails of the weathers sheared close all along down from the rump, so that their tails hung down like rats-tails : I inquired the meaning of it, and was answered, that they always did so in the Isle of Wight both to weathers and ewes, and particularly to the latter, because they so bepluffed their tails, that it burned and scorched up their dugs.—They sometimes began to do it in the beginning of April, sometimes not till May, according as the season proved.—My bailiff says, they have the same custom in Hertfordshire.

Of care in
shearing
ewe-lambs.

§. 45. Shearers ought to go very soberly and carefully to work, lest they cut off the ewe-lamb's teat, and yet, be they never so careful, that may sometimes be done ; and in such case they ought to take care to mark such a lamb, that it may be fat-
ted.

Of care,
that sheep
may not
scour be-
tween
washing
and shear-
ing.

§. 46. I was talking of driving my sheep into a lay-ground of fresh grass after washing, and before shearing : but many that were present said, by no means ; for that would scour them, and foul their wool ; and also, when drove into the barn, they would be trampling in their dung and daub themselves ; therefore, said they, we take care to give them the shortest pasture, after washing till shearing, we can get, that their dung may be pellets.

Of prick-
ing sheep
in shearing

§. 47. In shearing the danger is, lest any of the sheep should be pricked with the shears, which if done, and not taken notice of, so as to cut it out with the shears, it will be apt to rankle, and kill the sheep in twenty-four hours time ; but cutting does little or no prejudice if tarred.

Of sheep
being smo-
thered in
the shear-
ing-barn.

§. 48. The night before shearing we drove the sheep into the barn, lest rain should come : my shepherd,

shepherd, and those who helped him, were in fear lest any of them should be smothered, and therefore they ought to be looked to, to see they keep their faces in the air. — My next neighbour lost seven or eight in one shearing-time, and divers others have had the like misfortune happen.

§. 49. Mr. Weedon, and Mr. Cowslade of Wood-Fatting-hay, usually shear and wash their fatting-sheep by ^{sheep in inclosures to be sheared} May-day: the reason they give for it is, because ^{early.} their inclosures are very small, and consequently too hot, and therefore their fatting-sheep need to have their coats off so much the earlier, and they thrive the better for it.

§. 50. 'It was an ancient custom (as the ^{Of plucking sheep-}Rei rusticæ scriptores tell us) to pluck the wool from the sheep's backs, instead of shearing it, and this custom lasted in some places even to Pliny's time, and Varro derives the word vellus, a fleece, from vello, to pluck.

§. 51. I never used to shear till the Monday before Midsummer-day, but I now (anno 1714) find ^{Sheep well kept may be sheared the earlier.} I was in an error in so doing, and that, as my keeping is very good, by which means the wool grows the larger, and heats the sheep the more, and their fleshiness being such as to bear the cold the earlier in parting with their fleeces, I ought to begin to shear the first week in June; and the sheep would not only thrive much the better, when the load of their wool was gone, but their new wool would also have more time to grow against Weyhill fair, which would make the sheep look more burly. Sheep when shorn have better stomachs, for the heat of the wool takes away their appetites.

'Oves non ubique tondentur; durat quibusdam in locis vellendi mos. Plin. lib. 8. c. 48. Et Varro de re rustica, lib. fol. 64. ait, Ex vocabulo—vellera, animadverti licet, prius lanæ vulsuram quam tonsuram inventam.

What

What in scripture is translated the shearing-house, signifies in the original, the house of the shepherd's binding ; for they bound the feet of the sheep when they sheared them. Vid. notes on 2 Kings x. 12.

To avoid
housing
sheep if the
weather
will permit,
before
shearing.

§. 52. Two or three days before my sheep-shearing, I was consulting with my shepherd how to provide barn-room enough to house my sheep the evening before shear-day, in case it should be likely to rain that evening.—He was very desirous to have more barn-room than former shepherds, to keep his sheep cool ; but had great hopes the weather would be so very fair, that they need not be housed till the morning of the shear-day ; for, said he, the housing them over-night before shear-day, when they are loaded with wool, heats them so, that when they are sheared they catch cold, and will be glandered, and snivel very much.

A great
advantage
to poor
sheep to
have mode-
rate wea-
ther after
shearing.

§. 53. The shearers agreed, that, if sheep were poor, it was a great advantage to them to have two or three good seasonable and moderate days of weather after shearing, for, if the sheep were poor when sheared, and two or three hot days came presently upon them before they were settled, it was wonderful to see what alterations it would make on them : their skins would turn scurfy and starky, and their wool grow thin : and, if the weather should prove cold, and exceeding wet, it would quite chill such sheep ; about six weeks ago, it being about Midsummer (anno 1699) a mighty cold and wet day and night falling on such sheep the next day after their shearing, they were fetched home dead in dung-pots ; but neither of those sorts of weather had much effect on fat sheep, or those in very good case.

Why they
shear lambs
in Hamp-
shire and
not in
Wiltshire.

§. 54. I asked farmer Biggs, Mr. Edwards being present, why they sheared their lambs in this country, and not in our part of Wiltshire. They said, they judged we folded not so much as they : and that lambs being folded and kept hot thereby, it would

would increase their tick which breeds in them; and they observed the wool, if let alone, would quite eat out the flesh of the lamb, and bring it to be out of case.

§. 55 Many farmers in Hampshire always let alone shearing their sheep till a week or ten days after the washing; it is held that the sheep's sweating so long in their wool does it good, and makes it weigh the heavier.

Not to shear till a week after washing.

Farmer Biggs and I discoursing on sheep-shearing, the farmer said, it was a great damage to wool to have the moth, which was chiefly got, especially if the wool was kept above a year, by laying it against a south, south-west, or other damp wall, or by shearing the sheep before the wool was dry after washing.—But, said I, how can one help it? if shearing-day be set, and it should so fall out that much rain should fall between washing and shearing-time.—Said he, the rule of the country is, that farmers that use the same shearers, and are to come after, must put back their shearing-days, that you may stay till your wool be dry: but, added he, such hindrance seldom happens, for, lest rain should fall the night before shearing-time, they that have barn-room use to drive their sheep in there the night before, or, if rain should fall on them the day before, they will drive them close up into a barn, where their wool will heat, and the wet soon be dried up: others will not drive them up into a barn the night before shearing, if not likely to rain, but will watch them, lest rain unexpected should come.—And they that have dry downs for their sheep to go in, will keep them a week or ten days after washing, before they will shear them, that the sheep may sweat in their wool, which is a very good way; for by the oily goodness the wool gets, it will grow till that be spent after shearing.

Id. and of the moth in wool.

S H E E P and L A M B S.

On the contrary, Mr. Raymond and his shepherd were discoursing on washing, and proposed washing to be on a Monday, and shearing the Wednesday after.—I asked if that was not too soon; they said, no, the heat of their bodies and the sun would dry their wool in one day and a night, and that many farmers would shear the next day. — The shepherd seemed to be desirous of having it done the sooner, lest the fly should damage the wool by blowing it: all however agree the wool should be dry before it is sheared.

Of not
marking
sheep till
two or three
days after
shearing.

§. 56. In shearing the sheep at Sir Ambrose Philipps's, the shepherd gave them the ruddle-stroke, but not Sir Ambrose Phillipps's-mark. — I asked him, how that came to pass; he said, he thought it was better to let them alone two or three days first, for while they were so bare of wool they were apt to be burnt with the iron, which would make the place sore and subject to the flies.

O F F O L D I N G S H E E P.

Of the
sheep-folds
of the east-
ern coun-
tries.

§. 57. Numb. xxxii. 16. "And we will build sheep-folds here for our cattle." Which looks as if such husbandry was in use then as is now-a-days. But quære the original, and see the 14th verse, which being compared with this, it seems their sheep were kept in immoveable houses, not in immoveable folds as now-a-days.

Columella says, "Quæ circa Parmam & Mutinam macris stabulantur campis." lib. 7. fo. 173.—Therefore it seems they had some way like our sheep-folds, and did not trust altogether in sheep-coats.

It further appears, that the sheep-folds of the eastern countries were not such as our's, but houses, to which

which the parable of our Saviour in the tenth chap. of John has relation, as well as to the usage of the shepherd's going before, and calling the sheep after him. See from ver. 1 to 5.

Mr. Garret, who has lived four years in Spain, Id. in affires me, that in those parts where he was, they fold their sheep as we do our's, only their fold is made netwise with strong cords, and about six feet high with the bottom staked down to the ground, and two cur-dogs, of a breed between a mastiff and a greyhound, lie within the fold, to guard the sheep from the wolf.

§. 58. In favour rather of keeping a weather-flock than an ewe-flock on the hill-country, besides other conveniencies, you may have the benefit of the fold for barley at the principal time when it does most good; viz. on the fallows between the latter end of February and the middle of April, when the ewes cannot be folded.

§. 59. The limitation of an ewe-flock for folding and keeping on throughout the winter, or be it a weather-flock, ought to depend on these rules, 1st, Not to keep more at winter than you can winter either by meads, or sowed grasses and hay.— 2^{dly}, Not to be satisfied that you can provide hay for them by sowed grasses, as broad-clover, &c. in case such lands, as are fittest to carry such grasses, lie at a distance for mowing, whereby you must maintain them with dung, where, by reason of carriage, it will be chargeable, unless your fold can maintain more ground than your out-lying lands to your farm, which in the hill-country is not likely: and to carry but seven or eight pots of dung in a day, by reason of the distance, and mowing, is not reaping a profit, but bare exchanging: but, if you have much land round about, and near your house, whereto you can carry thirty or forty load of dung a

A weather-flock preferable to an ewe-flock in the hill-country.

Rules for keeping a flock through winter.

day, and which will bear broad-clover hay, then you may increase your flock proportionably.

Not to
weaken
your flock
by drawing
out ewes
and lambs
for fattening.

§. 60. As to fattening your ewes and lambs out of your flock, if you have lands disposed for fattening, you ought to consider, if you break your flock by drawing out ewes with their lambs for that purpose, what flock you will have left to fold on your wheat-fallows, and how far your wheat-land stands in need of a fold; for if you leave yourself not sufficient, it will be indiscretion to weaken your fold; besides it will hurt your breed; for you will draw off many forward lambs, which might perhaps have carried on the breed otherwise, and when a hill-country farmer is settled in a flock, it is not good to be buying yearly, to keep up his complement, on account of many damages which may from thence ensue: it is better therefore in such case to buy ewes with their forward lambs to put into your fattening grounds; but in case you sow wheat-land good enough without the fold, or have another way of manuring it, by liming, &c. then it may be very well to fat off certain numbers of your flock.

Of winter-
folding,
and folding
on barley.

§. 61. Though, says a very good farmer of my acquaintance, I have but a mean opinion of winter-folding, or to fold on barley sown, and may in time fallow on grass-ground instead of barley-land, yet I would fold on barley-land fallowed or stirred, from the time my lambs were stiff enough after lambing to go on such fallows, for, says he, the benefit of an acre so folded is three times as good as one winter-folded for barley.

Ewes and
lambs pre-
ferable to
weathers
for folding.

§. 62. Farmer Glyde of the Isle of Wight, with whom I was talking of husbandry affairs, told me, there was one thing he believed I knew not of, which he would tell me; he would, he said, advise me to fold my ewes and lambs on the barley-land in the spring, and divide my flocks in folding, for, said

said he, two hundred ewes and their lambs will do as much, if not more, good by folding on an acre of land, as four hundred weathers: I have, said he, folded apart on the same land at the same time two hundred ewes and their lambs, and in another fold of equal dimension five hundred weathers, and I have always found, that the folding of the ewes did me the best service, and brought me the best corn.

§. 63. My shepherd is of opinion, that ewes ^{Of folding on barley, &c.} ought not to be folded on the barley-fallows, or any other fallows in lambing-time, but weathers only; for the lambs being wet when lambled would be dirtied with the fallows, and the ewes would presently forsake them; therefore the ewes ought in lambing-time to be folded in the meadows, where it is clean, and the folds removed as often as the cold wind should change from corner to corner. — And afterwards, he said, they ought to fold weathers on the barley till a fortnight after May, but the ewes never after Candlemass.

It is plain that the early folding an ewe-flock and lambs in April, on wheat-fallows, pinches the lambs, and so does folding them at that time on the barley-grounds, both which are too cold for them, especially in our hill-country; care ought therefore to be taken, that those lands do not of necessity want folding on in those months, but that they may be otherwise provided for, and that during that time the ewe-fold may be on grass-grounds, or lay-grounds designed for fallows.

We must be more cautious in April and May of folding an ewe-fold on the barley-land, they being wettish, than of folding them on the wheat sown in August or September; because the lambs in April and May make the ewes rise often and move, whereby the ground becomes much more trodden at that time of the year by the ewe-fold, than it

* Young
sheep.

To drive
lambs late
to fold,
and let
them out
early.

Of the fold-
ing in Ita-
ly.

Of folding
on wheat
in October,
and of
winter-
folding.

would be by a weather fold, or an * hog-fold, as may apparently be seen, if the folds be divided.

§. 64. Telling Mr. Gerrish the grazier, and farmer Mles, how dear Mr. Eyres our minister fold fat lambs to the number of fifteen, May 18th, viz. for ten shillings and six-pence each, and that they had been folded all along to the very day he sold them. — They replied, that folding the lambs did very little hurt them with respect to their fat, provided they were drove pretty late to fold, and let out early in the morning.

§. 65. Sunt qui optime stercorari putent sub dio retibus inclusa pecorum mansione. Plin. l. 299. So it seems this was a folding as we do, unless by sub dio, be meant, by day.

§. 66. Walking with Mr. Raymond into his arable-common-fields October 25th (anno 1708) we met his shepherd pitching the fold on the new-sowed wheat. — I asked him, whether he did not find that pitching the fold on the wheat at this time of the year, and a fortnight later, turned to a much better account than folding for the barley-crop for the year following. — Mr. Raymond and his shepherd readily replied, undoubtedly it turned to the best account to fold after this time on wheat. — I said, for my part, I had observed the fold carried on the land designed for barley so early in the winter had little effect, it's strength being spent and washed away by spring, so that it will make but little shew in the crop of barley next summer, and that therefore I chose to preserve four, five, or six acres of wheat-fallow that lies warm, and will bear sowing late, to carry my fold over to the latter end of October, rather than finish my wheat-fold by the end of September, and then carry it on my barley; for though the latter part of October might, in our cold country, be too late to sow wheat, yet it was better

better than to be so soon folding barley, which would be no better for it. — To which they replied, I was much in the right. — And as I have before observed how insignificant the fold is in the winter, especially in hard frosts, I imparted it to Mr. Raymond, who concurred with me, and said, he had folded on arable land in snow, and found not the least benefit: whereupon he resolved in such cases to fold on meadow and pasture, in mighty expectations of grass, but it made no return, wherefore in snows, he now lets his sheep ramble.

§. 67. Whereas I have said, that in cold clay-ground, and in a cold high hill-country, a winter-fold does little good, yet I have by experience found the contrary in such parts of the hill-country, where the land is dry and light, and that it does great service to the barley crop. — This difference may be reconciled thus, i. e. where the land, though called hill-country land, does not lie very high, for the height much tends to the chilling of the ground: again, the explanatory reason of this difference, though hardly accountable for, yet seems to me chiefly to lie in the chilling quality of the ground which at first receives the dung and piss, and that deadens the ferment; whereas in warmer ground it's progression toward that end is supported by a sufficient benign warmth, since in both sorts of earth the urine does undeniably sink into the earth and mix with it.

Of winter-folding in the hill-country.

§. 68. My ground being cold and feeding, I should in the spring of the year, when I come either to pitch my fold on the barley-fallows, or on the sown barley, set it very wide, in order to avoid the usual inconveniencies of penning at that time, viz. the rankness and lodging of the barley, and the consequences, thinness and coarseness.

To fold wide in spring on cold feeding ground

§. 69. It was the 10th of October (anno 1720) when my fold was going to be set on the wheat-fallows

Caution against folding on wheat in wet land soon after sowing.

lows of a field, which was heavy land, and the fallows, where the fold was to go, were to be ploughed up the next day; I was afraid the land would be too wet to fold on after the wheat was sown, and spoke to the shepherd about it. — He said, he believed I might be in the right, especially since the rams had been some days put to ramming the ewes, because the rams would keep moving and stirring the ewes all night in the fold, whereby the ground would be battered and trod, and so squatted that the wheat might not get through.

Of pen-
ning sheep
on hurdles.

§. 70. That the Greeks did pen up their sheep that they might piss through hurdles, as in Herefordshire, you may see in Palladius's calendar, November, to avoid dirtying and damaging their fleeces.

Of turning
arable to
meadow.

§. 71. Farmer Miles, whom I have often mentioned with approbation, advised me, if I would turn arable into meadow, and lay it up to grass, to fling straw upon it that is less than half rotten, and then fold upon it the same night, and it will bring the ground on very fast.

Of winter-
folding for
barley.

§. 72. Pursuant to what has been before said, that folding in winter for barley is not profitable, because, by waiting for the fold's running over the land, we lose the principal season of fallowing; yet however it may be proper to fold till Christmas, and then go on the wheat-lay; because we can lose no fallowing season by that; we cannot well have finished our fallowing any year before Christmas.

Id. in Lei-
cestershire.

I find by Mr. Antill and Mr. Clerk, and others, that in Leicestershire they have no winter-folding for barley; they leave off by Michaelmas at farthest, and sometimes cannot fold again till May; the reason is, their lands are so wet they would be always in a poach, and the coldness of the lands would kill the sheep: to help which defect, they muck

*muck their barley-lands, and from thence begin *Dung.
 their husbandry, and sow wheat the year after, often
 under furrow, on their barley-stubble, for they say,
 if they should dung their wheat-ground it would rot
 their wheat, and they sow peas or beans after the
 wheat, and then lay the ground to summer-fallow
 again, to be mucked in May for barley, or to fold
 for wheat; so that they carry out their dung before
 it is half rotten, or the seeds of the weeds killed:
 but in their inclosures they sow four crops of corn
 all on one earth, without dung, for the most part
 beginning with oats, and laying down to grafs with
 wheat.

§. 73. I am told, that in Dorsetshire the aim of ^{Folding in}
 the farmers is, to fold on their sheep-leases in the ^{Dorsetshire.}
 middle of July; and so till Michaelmas, that in the
 winter there may be a good head of grafs for the
 milch-ewes.

§. 74. It seems to be inconvenient to grasp at so ^{Of folding}
 large a wheat or barley-crop, as hardly to be able to ^{unseason-}
 compass it without folding late on the wheat after it ^{ably.}
 is sowed, or on the barley-land after it is sowed; for
 by being under the above necessity, in order to com-
 pass what one has engrossed, one may often be ob-
 liged to fold unseasonably on each sort of corn, nor
 will the fold in that case make good the damage
 done to the flock by the lateness of the season: and
 an ewe-fold is often damaged by folding on the cold
 land at the latter end of October; whereas it is bet-
 ter to come early with your fold off of the wheat-
 lands on to the barley lay-grounds, and from the
 sowed barley on to the wheat-fallows; for there-
 by you will fold the same quantity of ground of
 the respective grains without the respective incon-
 veniencies.

Between washing and shearing-time sheep ought
 not to be folded, because of dirtying their wool, nor
 from the cutting of the lambs till a fortnight after,
 nor

nor in sheep-leases or arable in wet weather, for it will tread the grafs into dung,

Of folding
in frosty
weather.

§. 75. A servant of mine, a man of very good understanding, tells me, he has been many years a shepherd, but could never observe that the fold ever did any good in frosty weather : particularly he remembers a very sharp frosty winter, in which a whole flock used daily to gather to a hay-reef, in a ground where they were foddered, yet he could not observe there was any better corn there than elsewhere.—I asked him the reason of it ; he said, the frost wasted and preyed on the dung ; and I the rather approve this observation of his, because of the great prejudice strong beer and spirits receive by being frozen, even so as to become mere caput mortuum.

If frost has the same effect on dung, by improving it, that it is said to have on the sheep-fold, and on strong beer : quære, whether it be proper or not, to leave horse or cow-dung spread on land without ploughing it in.

Mr. Raymond is also of opinion, that the winter-frosts do very much deaden the folding of the sheep, and rob it of it's virtue.

What land
to fold first.

§. 76. Farmer Elton said, the method he best approved of in folding, was always to fold that land first that was first designed to be ploughed, such as white or whitish land, they not being apt to bear weeds, nor will the fold be apt to cause weeds to come, and such land he would sow first, viz. at St. James's-tide.—I said, I should think, though such land should be sowed ever so wet, yet, if the month of August should prove dry and scorching, it would burn, and suffer by such early sowing.—He replied, if sowed wet, yet so as it came up, he never knew the drought to hurt it.

Of folding
on barley in
a dry season.

§. 77. It was a very dry season from the first of March to the sixth of May. (anno. 1701.) during which

which time I set my fold on my barley.—Several of the farmers in my neighbourhood said, it would be apt to do the barley more harm than good, for the sheep would scratch up the seed; whereas if rain had come, so that the ground had not been in a dust, their scratching would have done no harm.—But I rolled before I set my fold, and so I presume the ground was so fast as to receive the less damage, it being also stony, and therefore the sheep could not search it so much as otherwise perhaps they might have done: the event was, the fold did no harm, but good.

§. 78. Mr. Gilbert of Madington was telling me, the way of husbandry about him, near Salisbury, was, to fold on their wheat after it was sowed till St. Luke's-tide, which is in the middle of October; then to draw off their flock for a month to fold their sheep-leaves, and then on the barley-fallows.—I asked some North-Wiltshire farmers, if about them they ever folded on the wheat-land after it was sowed; they said, no, they never knew it to be done in any parts thereabouts, yet folding after the corn was sown did it more good than before; but the reason why they did not do it about Holt, &c. they believed was, because they were forced to lay up the wheat-lands in high ridges by reason of the deepness of the earth, and it's wetness, and the sheep if folded on such land, would do nothing but lie between the furrows, which would do the land but little service: besides, they said, in the hill-country the land was rather of the lightest, and the treading of the sheep, after it was sowed pressed it closer than it was before, and so did it service.

§. 79. Mr. Raymond assured me, that sheep folded on sandy lands would thereby be sensibly more improved than those folded on clay-lands, and this, said he, the shepherds agree to, who live where there are such

Of folding
about Salis-
bury and
Holt in
Wills.

Of folding
on clay and
sandy land.

such different sorts of land.—The reason seems to be, because the sandy lands draw forth and drink up the moisture of the sheep, to fill up which emptiness of the outward vessels, a fresh juice must succeed, and so on; or else that the sandy lands being hot, make the sheep perspire more than clay-lands do, whereas the cold clay rather repels perspiration.

If sandy or light ground, as has been before hinted, draws the fat and moisture of the sheep-fold off, so as to impoverish a flock more than if they had been folded on cold clay-lands, it must be allowed on the other hand, that light ground may be better enriched by a fold than heavy land, because the light ground imbibes more of the moisture and fat of the flock; and this gives some account why it is said, poor lands often pay better for their folding than strong lands: for the same reason winter-folding, when the ground is wet and cold, holds no proportion to summer-folding.

Of folding
on fallows
in winter.

§. 80. Discourſing with farmer Biggs on husbandry, he said, he folded on the fallows all winter long, though never so wet; yet, said he again, sometimes the fold does harm: let it be never so wet, said he, early in the year, folding on the fallows does no harm; for, in the first, there is heat enough in the ground at the first hand of the year to keep off the chill, and then the ground is not so settled, but that the rain soon runs through it, but at the latter end of the year the ground is settled; then treading it with the fold in wet weather makes it hold water, by which it may be chilled, and kneads the very wet into it, whereby there will be the less corn.

Of folding
on barley.

§. 81. Before I came from Crux-Easton in February (anno 1698) in order to go into the Isle of Wight, I had a discourse with an old experienced shepherd about folding the flock on fallows: he said,

said, as to wheat, it was excellently good, but they rarely folded on barley-land after it was sowed; for if it was a whitish land, and a hot summer came, it would be burnt up: besides, the sheep would be scraping at that time of the year on the barley-land, and would take the corn out of the ground; but the wheat, said he, lay too deep for them to do so.—But when I came into the Isle of Wight, farmer Collins was of a different opinion, and said, he had always folded with good success on hot dry sandy ground after it was sown with barley, and was earnest with me to try it; for, said he, you will quickly see the benefit, and though the sheep should scrape, you will find the barley come thickest there.—There is land however about Husborne and Stoke in Hants that will burn by folding on in the spring, and get more harm than good, if hot weather come, it being a hungry sharp gravel.

§. 82. As it seems to me, the double folding on the early wheat-fallows, to be sown on one earth, cannot occasion the roots of the grass ploughed-in to shoot up afresh, but rather prevents it, by treading the earth down into a hard plaister, so that they cannot rise; it is true, it may bring up a fresh new grass, which, having weak roots, will easily be torn up by the draggs.

§. 83. * Columella, speaking of feeding sheep, says, there is no sort of land, or food, but what (by the continual use of that only) sheep will be tired of, unless you give them some salt now and then to lick, from whence they may procure a new appetite to

* Nec tamen ulla sunt tam blanda pabula, aut etiam pascua, quorum gratia non exolecat usu continuo, nisi pecudum fastidio pastor occurrerit præbito sale, quod, velut ad pabuli condimentum, per æstatem canalibus ligneis impositum, cum è pastu redierint, oves lambunt, atque eo sapore cupidinem bibendi pascendique concipiunt: Colum. lib. 7. fol. 175.

will their wool and their soil pay for it, and overpay too.—— He said, a weather would grow fat with hay sooner than with grafs : and, if the snow be but moderately deep, viz. not above a foot, the sheep will scrape for the grafs : but then in severe weather care ought to be taken to put them in a ground out of bleak winds, and where the grafs is longest, as having been first hayned.— He approved not of the Hampshire way of sitting up with their folds in lambing-time ; for their walking up and down with their lanthorns greatly disturbs the fold, and makes the ewes apt to be frightened, and to run away from their stands in the fold, by which means the lamb is either over-laid, or separated from the ewe ; whereas otherwise the ewe and the sheep folded would keep in the same place.—— He likewise says, the best thing that can be done in lambing-time is in hard weather to sling five, six, or seven trusses of hay into the fold amongst the sheep, for them to trample down, to save the lambs from being frozen, and to keep them dry : the hay, says he, is of an insignificant value to the service it does to the lambs.—He adds, if it be a wet season in lambing-time, the folds ought to be made the larger : if a hard frosty time, the closer the better, nor need one be afraid of the lambs being over-laid, if the fold is not disturbed.—— He says, in lambing-time, the fold ought to be visited in the morning, and the first thing to be done ought to be to walk round it, and see what outermost ewes have lambed, and then slip a hurdle and draw the ewe and lamb out carefully, that the ewe may go away with her lamb to graze, and keep together ; for, if the flock be let out with them at the same time, it is the nature of the ewe to go away to graze, and amidst the whole flock the ewe and lamb will soon lose each other : then you should go inward, still drawing out the outermost ewe and lamb.

§. 85. That there is an idiosyncrasy in cattle of the same sort, or species, has been already hinted; to which may be added, that farmer Iles my tenant assures me, that if they about Holt, i. e. in the vale, buy sheep against the winter out of the hill-country, such sheep will, as usually, expect a great deal of hay, though they have never so much plenty of grass. — And probably they may in a great measure expect it, through their constitution of juices; for otherwise it cannot be supposed how giving the younger sheep hay in the hill-country, but perhaps for one year, should entail a necessity of continuing it for the next, where the juices of the grasses so much exceed those of the hills.--To exemplify which, having bought sows with pig out of the vale, for the sake of a large breed, where they had been used to be fed only on whey; these sows, when they were brought into my yard in the hill-country, where there was plenty of shattered corn, sufficient to keep my own country hogs, which thrived well on it, grew lean, and made but a poor livelihood; and what more surprized me, the pigs of these sows which were littered with me, took after grazing, and, when they came to be great hogs, they would not stay in the stubble-fields to get their bellies full, but would soon beat out into the grass grounds, and so would the breed of the breed last mentioned do. — Thus says Horace, “Fortes creantur fortibus, nec feroces aquilæ pavidas generant columbas.” — And this idiosyncrasy seems more visible in beasts and men that live on the simplest food than in those that live on varieties.

§. 86. It ought to be contrived in hill-country-farms, which usually have but a few acres of meadow and pasture, and the rest in arable, that there be a few acres of arable (according to the bigness of the farm) laid down on different parts of the farm,

To provide grass ground to receive the sheep occasionally.

therein commodiously to receive the flock of sheep after harvest, as often as the stubble-grounds may be dirty ; for in wet weather, if the flock should go in such stubble, they would spoil more than they eat.

—— But yet, if grounds are laid down yearly to clover-grasses, as is usual in the hill-country, then it is to be noted, that grounds of the second year's clover are very fit to receive the flock of sheep in such wet weather ; for ground of the second year's clover is well settled and covered with grass, nor will it be like to be trampled to dirt, it being firm, nor is it gnash and luscious, as the stubble-clover is, and so is very fit for the sheep, and will not put their mouths out of taste for other coarser grasses, as the stubble-clover will do. — Nevertheless fattening sheep may be suffered to feed freely on the stubble-clover ; for they must be supported with other grasses, as good as that, had they not that, and sweet pasture of natural grass must be found for them when that is fed out.

Turnips
apt to
breed wind
in sheep.

§. 87. Having in November (anno 1707) a good crop of turnips for the winter-feeding my flock of sheep, I had a desire, before I entered on the doing it, to consult a farmer's shepherd, who had for many years used his sheep to turnips : I understood from him, as also from others, that turnip-feeding was apt to breed wind in the sheep and gripings, for which, while they were under the distemper, they knew no remedy, but to cut their throats, if they were fattening : you may perceive the distemper by their stretching out their limbs, and spreading them : but, to prevent this evil, they agree it is necessary to give the sheep some dry meat in the evening, though coarse.

It is farther agreed, that an ewe-flock is not so subject to the abovesaid distemper by feeding on turnips, as a weather-flock would be, the lamb in the

the ewe carrying off the water, that, in such case, the ewes are overcharged with from the turnips; for the ewes, when with lamb, piss and dung much more easily and plentifully than the weathers do; which is but reasonable to believe, all creatures with young being apt to make water often, and dung, nor are they so able to retain it as when not so: and particularly physicians look on child-bearing women to be more secure from cholick, gout, &c. than when child-bearing is over, for the abovesaid reason.

§. 88. It is a thing commonly known, that after harvest sheep must be kept out of the barley-stubble till the hogs have eat up the scattered barley, lest by swelling in the maws of the sheep it should kill them.

Sheep to
be kept out
of new
stubble.

—— But I also find by my shepherd and others, that sheep ought to be kept out of all sorts of stubble till the corn is well eaten up by the hogs; because the wheat and oats they leave will be apt to make the sheep scour, as this year (anno 1719) wheat made many of my sheep scour.

§. 89. Tills are excellent good for ewes, to breed milk for their lambs, being given them instead of hay, and is the true use of that grain: they will grow very well in strong clay-land, but are rather reckoned an impoverisher than an improver of the ground, contrary to what other kidded grains are.

Tills good
for ewes.

§. 90. The reason why sheep are in less danger of being hurt by broad-clover than cows are, may be, because the sheep feed only on the very finest and tenderest part of it, nor can they easily be brought to taste of the grossest part of it: this I plainly saw, when I fatted sheep in the broad-clover this year (anno 1702). — It is however a luscious food, and apt to throw sheep into a scouring.

Why
broad-clo-
ver more
hurtful to
cows than
sheep.

Broad-clover will not fat sheep so fast, nor so well as hop-clover will do.

Of putting
sheep into
woods af-
ter shear-
ing.

§. 91. Farmer Elton advised me by all means, if the season proved dry after my sheep were sheared, to put them into my woods of four or five years growth, for a week or a fortnight : he assured me, if it were a dry time, they would do the woods no harm ; for in that case the rowety grass in the woods would be sweet, and the sheep would not be tempted to crop the shoots ; but in wet weather the rowet turns sour, — This, he said, would do them a great kindness in sheltering their coats from burning, and their bodies from damage thereby : and at the shepherd's whistle they would all come out of the woods to folding. — It may be serviceable to the sheep, but I doubt of the former part of his assertion, viz. that they will eat the rowet, and not crop the shoots. See my observations on woods.

I had a few teg or hog-sheep of my own, and at Michaelmas I bought in some more, and put them then into the meadows, the hedge-rows of which being cut the year before, put them upon browsing at that time of the year. — About the latter end of November, I put them into my young coppices, where they soon fell to browsing : we wondered at it, and were at a loss for the cause ; till my shepherd remembered me what we had done, having enticed them into the fault at the first hand of the year.

Of leaves
for sheep.

§. 92. Cato dicit, fol. 2. Autumnitate frondem populeam, ulmeam, querneamque cædito per tempus ; eam condito non peraridam, pabulum ovibus. So that they were not the dead worthless leaves they collected, but they stripped the branches of their leaves whilst growing, and made a kind of hay of them.

Swine's-
grass bad
for sheep.

§. 93. ¹ Poligona, knot-grass, swine's-grass, or blood-

¹ Est etiam ovibus gravis perniciēs herbæ sanguinaræ, quam si pasta est ovis, toto ventre distenditur, contrahiturque, & spumam

blood-wort, according to Columella is very pernicious to sheep, occasioning violent distentions and contractions in their bellies, by which they bring up a thin, frothy, stinking matter. — The cure is to bleed them under the tail, close to the buttocks, and also in the upper lip.

§. 94. The *Maison rustique* speaking of sheep, says, in winter, autumn, and spring, you should keep them close in the morning, and not carry them to the fields until the day has taken away the frost from off the ground: for at these times the frozen grass begets a rheum and heaviness in their heads, and looseneth their bellies. fol. 157. The same observation has been made by the antients, as I have noted before.

Sheep not to be drove to the field too early in frosty weather.

Some say, that, in the open moist weather in the winter, the sheep have more need of hay than in the cold frosty weather, and it does them more good; for it dries up the water, the grass then making them flue.

§. 95. In deep fat lands farmers may be in the right to hope for, and to endeavour to preserve their sheep without hay in winter, or as long as they can, because their lands may be able to do it; yet, quære, in case they should buy in sheep to winter, which have been used to hay, whether such sheep will not only expect it, but will not also pay for it, if it be given them. But for hill-country farmers, whose winter-grass cannot be supposed to maintain their flocks, I say, they ought to fodder in good time; otherwise their flocks will soon eat up all their grass, and then they must, as they draw near to lambing-time, eat all hay, which is not so well as

Of foddering sheep in winter.

mam quandam tenuem tetri odoris expuit, celeriter sanguinem mitti oportet sub cauda, in ea parte quæ proxima est clunibus, nec minus in latro superiore vena solvenda est. Colum. lib. 7. fol. 178.

hay and grass earlier in the winter would have been ; and then the grass would have held out.

Racks for
foddering
sheep com-
mended.

§. 96. Farmer Biggs commending racks to fodder sheep in, said, it was a very wasteful, slovenly way to fling the hay loose about the fold, as some would do ; for whatever hay the sheep sat down on, neither they nor any other cattle will touch after, for which reason no cattle care for feeding after sheep, their dung and piss being a great nuisance ; but cows, said he, had rather pick the dungy straw and litter on the dung-hills, which comes from the horses, than to have the sweet clean straw that comes out of the barn.

On my asking several good shepherds, why they set the hay-reeks open to the sheep in each ground ; they assured me, that, in that country, Dorset, they had tried all ways of giving fodder to the sheep, and did find, that to let them go to the racks when they had a mind to it, was best ; for many sheep liked grass, and would thrive better on it than on hay ; and others would eat hay better than grass, and if the hay was very good, they would give as good milk for it ; and many sheep would eat it best, if you let them have their own time of eating it.

Of cribs.

A very good shepherd near me, approves very much of cribs for foddering sheep in : he says, in wet weather they they save littering of the fodder, and trampling it under foot : — but he says, sometimes a cow or a sheep has hung it's horns in the bow, and broke it's neck, but this rarely happens : that the gentleman whom he serves had only lost one heifer by such accident in twenty years time, and a sheep or two. — Another told me, his master never lost any cattle that way ; but one morning, said he. I came in good time, and saved two that were hanging.

I told my shepherd what sort of racks I designed for

for my sheep to be foddered in, which were according to the Dorsetshire fashion, as the shepherds there had advised me to make them; and he approved very well of it for the saving of hay: but, said he, the cow-cribs with bow partitions are very serviceable on one account; for when an ewe, by reason of a lusty lamb, has had a hard labour, whereby the lamb is stunned, or much weakened, such lamb will be able to get up and suck, by strengthening itself with leaning against such cribs as they lie in the fold.

§. 97. Farmer Biggs said, that he was confident, ^{What hay} if it was a hard winter, 300 sheep would eat 25 ^{if sheep will} if ^{eat in a} not 30 tons of hay. — Farmer Crapp said, he had ^{hard win-} often given above 25 tons to that number of sheep. ^{ter.}

Mr. Slade of Tilshade tells me, that they allow a ton of hay for every score of sheep they winter on their downs, and provide for the winter accordingly.

I asked my shepherd, what quantity of hay would maintain a sheep at Easton in a hard winter. He gave me no ready answer; I told him, I looked on five todd and an half to be a noble provision: he could not rightly fall into a consideration of that proportion, but said, if it was a hard winter a score of sheep would eat a ton of hay. — Whereupon we computed the difference of our estimates, and found that mine held a fourth part greater than his: however he said, he thought his a great allowance.

§. 98. Farmer Elton told me, that his father ^{Of provid-} and he had lost many a pound by not buying ^{ing coarse} coarse ^{hay early} or under-hill hay at the first hand of the year for ^{for winter-} their ewes; for, when a hard winter has come, they ^{ing sheep.} have been forced to give them a coarse hay at last, which has impoverished them, and made them pitch, and in the breed made them spoil the whole flock.

§. 99. About Tilshade in Wiltshire there is little ^{Vetches} hay, and the chief support of the sheep during win- ^{for sheep,} ter

ter is vetches : Mr. Slade assures me, if vetches cut greenish for sheep should take a month's rain at first, if they can at last be housed dry, the sheep will eat them stalks and all better than the best hay.

Housing
sheep bene-
ficial to
their wool.

§. 100. I have heard, that in Spain they house their sheep on nights, which I doubt not but contributes to the fineness of their wool.—And the warm fold, made warmer by the sheep than of itself it would be, is better for the wool of the sheep than for them to lie abroad.

What
sheep to be
first fattened.

§. 101. In fattening sheep, the barren ewes, and those which have lost their lambs, come first in order, and then old sheep that are to be fattened with grass.

Whether
ewes
should be
rammed
before fat-
ting.

§. 102. Sir Ambrose Phillipps's shepherd being in discourse with me, I asked him, supposing one should fat sheep, whether the case was not the same with the ewes, as with cows to be fattened ; that is, whether or not the ewes might not be first rammed; and whether they would not then fat the kindlier for it. He replied, the case was not the same with ewes as with cows ; for the ewes would take ram but at one time of the year only, some earlier, others later : but besides, the ewes going but twenty weeks with lamb, they contrived they should not be with lamb, because they would be too forward with lamb before they could be fat. — I then asked him, if he ever knew a ewe bring a lamb twice in the same year. He said, never ; but an ewe that had warped her lamb very early might sometimes have another within the year, though very rarely. — He says, the graziers contrive their cows should be bulled at such a time, as that they might be fat for the market by the time they are half gone with calf, for then they tallow best, and their meat is a great deal the firmer for it.

Of fattening
a ewe that
warps.

§. 103. The farmers in the Isle of Wight reckon

an ewe that warps any time by or before the middle of February, so that she may make early mutation, while it yields a good price, is as good as * An ewe and lamb.
* couples.

§. 104. It was the 25th of December (anno Weathers will not be fat in winter on hay only. 1707) when I had at autumn fatted twenty weathers, which I designed to kill after Christmases : at this time my shepherd came to me, and said, he could not hold up the sheep in their fat, unless I could find them some grafs to go with their hay : he told me they would waste the best hay he could give them, and eat but little of it.—Till now I thought one might have fatted sheep with hay alone, if it were very good : but on enquiring I have found, that such sheep as abovesaid, must have a little grafs with their hay.—Therefore, if you would have fat sheep to kill from Christmases till spring, you ought to contrive to keep a reserve of grafs for that purpose, or to sow turnips in autumn for the feed of their leaves.

§. 105. Mr. Slade of Tilshade, and Mr. Biffy of Of fattening lambs in the hill-country, Holt in Wilts, made me a visit : and having often before complained to Mr. Biffy, that I could not fat lambs at Easton, Mr. Biffy said, he was sure I might fat lambs at Easton ; only I must take this special care, to put the ewes and their lambs, within a fortnight after the falling of the lambs, into clover, and must keep them well, and not let them sink ; for both Mr. Biffy and Mr. Slade said, if once I let them sink, there would be no raising them again ; and Mr. Biffy said, I must take care not to let the clover be too high.

§. 106. I find by farmer Isles of Holt, that they Of fattening lambs in the vale on broad-cloves. fat the ewes so well, for they will rise but slowly in flesh :

flesh : the reason that he gave for it was, because the lambs were fatted in the spring, while the broad-clover was young and sweet ; for it will hold sweet and good, till towards Midsummer, but then falls off, which is about the time the latter lambs are fatted, and then the ewes will not thrive so well with it as the lambs will do. He sold his lambs fat this year, 1716, by the 20th of May, and then by Midsummer the ewes were well in flesh, that is, half fat with the broad-clover ; but then they got no farther by the broad-clover, only held their own till harvest, when they throve apace, and soon got fat in the stubble.

The same farmer, having been two or three times at Crux-Easton, and seen our broad-clover, admits, that we cannot pretend to fat lambs with it near so well as they can at Holt ; for the clover at Easton must be sourer and bitterer than theirs at Holt, both from the coldness of the ground, and the coldness of the air : for, said he, we at Holt, though we lie on a warm stone-brash, cannot pretend to fat lambs in a cold spring as we can in a warm one, for the said reason ; and particularly this dry and cold spring, 1719, I observed, added he, when I brought my couples home from where I had wintered them, the ewes would keep walking much about the ground, and continue bleating, whereby I knew they disliked their clover, and said I, I shall have no good fat lambs this year, and so it proved. — I like not, said he, when the ends of the wool on the backs of the sheep twist, and stand spriggy, as they were apt to do this year.

If a lamb
once pitches
for want of
milk, it
never recovers it.

§. 107. If an ewe's milk after she has lambed, dries away by reason of bad hay, or scarceness and poverty of grass, so that the lamb pitches, it will never be recovered, and lambs so pinched will never fetch

fetch it forward again, so as to be so well grown or so fat, or so soon fit for the market as otherwise they would have been; in all which respects there will be great loss, and this holds in some degree in other cattle.

§. 108. On telling Mr. Bissy what encouragement I found for fattening lambs at Crux-Easton, I also added the difficulties I should meet with in that affair.—He said, if I thought my broad-clover would prove too sour, and be apt to scour my lambs, I must sow half broad-clover and half hop-clover seed mixed together; and he said, that he and several others had of late (anno 1720) done so, and found it very effectual.----And I am apt to fancy, if a sprinkling of rye-feed, it yielding a sweet grass, was mixed with the clovers, the variety would be grateful to the lambs, and make them fat the faster.-----But it is my opinion, that if you reserve the fattest of your arable-land clovers, the land being in good heart, such clovers will be fat, juicy, sweet, and nourishing; for I have observed, that, when ground has been ploughed out of heart, though it was in it's own nature strong ground, yet the clovers it has produced have in their nature been weak, and their leaves thin and not sappy, nor of a deep verdure, but of a pale colour, and speckled on the back of the leaves as if fly-shitten, and consequently has no good nourishment in it; nor would hogs or other cattle abide in such clover any longer than they were forced to it; and the leaf of such clover has to my taste been an ungrateful bitter, whereas the fat sappy-leaved clover has been agreeable.

Of fattening
lambs in
the hill-
country.

§. 109. When sheep are thriving, their wool is of a bright white colour.

§. 110. I find by Mr. Gerrish of Broughton in Wilts, the great grazier, that the rising up of the fat on the back of a sheep in a bladderiness, or sort of froth

A mark of
a sheep's
having
been fattened
kindly.

froth and foam, is a very good sign of the kindly fatness of that sheep; which, says he, the turnip-fatted sheep will do even in the winter time, whereas the fat of our sheep, fed in winter on hay and good grafs, will lie close and flat on their backs, and not rise in bladders when they are flead. — He assures me, that thirty acres of very good turnips will fat four hundred weathers.

I went to Sir Ambrose Phillipps's sheep-pen with the shepherd: in handling the sheep he shewed me the piece of fat by the brisket, before the shoulder, which is called the mouse-piece, which I handled in many of them, it being bigger or less according to the degree of fatness the sheep is in: the dent also on the rump I felt in many, which is occasioned from the rising pieces of fat on each side, where the sheep are fat.

I asked the shearers of Garenton, where a sheep was to be handled to know whether it was fat or not; they said, if a weather-sheep or an ewe that never had a lamb, it was to be handled at the dug, and at the rump of the tail, for those that are very fat will sometimes be as big there as one's wrist, and the same on the brisket and shoulders: an old ewe is to be judged of in the same manner, except in the first mentioned place.

An experienced butcher who is to draw out a number of sheep at a certain price, will always choose for the fattest, though there are larger sheep in the flock, and in good case too; because the fatter the beast or sheep, the more juicy will his flesh be, and consequently weigh the heavier, which will make it most profitable to the butcher. — And a beast fatted by grafs will weigh heavier than a beast fatted by hay, because the flesh will be more juicy.

Of fatted
sheep, viz.
on turnips
and broad-
clover, and
of driving
them to
London,

§. 111. In discourse with several butchers, they agreed, especially if the winter proved wet, that
turnip-

turnip-mutton would be waterish, and not answer it's weight when killed, so well as other mutton, for perfect water would run out between the skin and the flesh, it being withinside : and, said they, your mutton fed with broad-clover does not give that satisfaction that other mutton does ; for the fat will be apt to look yellowish ; yet in truth no mutton eats so sweet as that, the fat whereof has a yellowish cast, though people do not generally like it.—They said further, that a sheep or lamb fatted would drive from Crux-Easton to London, with losing but a very little of it's weight ; this they said, because I told them that in driving from Holt in Wiltshire to London, a weather of about seventeen shillings price would lose eight pounds of flesh ; to which they replied, though cattle will not lose much flesh in driving fifty miles, yet if you drive them fifty more they will lose their flesh very considerably.—And, said they, a sheep barely mutton, such as we buy of you, will not bear driving to London, though it may be but fifty miles, because they would lose that little flesh they had got.—The hinder quarter of an ewe, that has had a lamb, is not profitable to us, nor acceptable, because the udder will waste, &c. — they owned, however, it was otherwise with a barren ewe, but, said they, there are few of those in this country. — If an ewe be going to ram when she is killed, the mutton will eat rank.

§. 112. I find by conversing with our Wiltshire graziers, that fat lambs come not to Smithfield from the North till after Whitsuntide, and then, though they are huge lambs, in comparison of the southerly and western, even as big again, yet they are very lean compared with our's of the southerly counties.—I find, one reason, why not only lamb, but mutton and beef also, out of Wiltshire and the southerly

Of the northern and southern lambs, and why the Wiltshire lambs, &c. sell dear in a wet spring.

206 Diseases in SHEEP and LAMBS:

southerly countries, sells dear in wet springs, is, because the roads from the North and Somersetshire, &c. are bad to travel on, and the cattle cannot go into those deep leaves, they being under water, or so trodden and poached, that, by reason of the cold, grafs does not thrive for a bite for the beasts, nor improve them till towards the middle of summer.

Diseases in SHEEP and LAMBS.

Of young sheep that have their gums grown over their teeth.

§. 1. **M**Y shepherd was talking in June (anno 1703) of drawing out my old ewes for the market; and said, in all likelihood there would be three or four of the younger sort drawn out with them; and for the most part it happened so every year; for now and then a young sheep, even one of two teeth, will have it's mouth hang over, that is it's gums will be grown out so long as to shut over it's teeth; and such sheep must as much be disposed of as broken-mouthed sheep, for they cannot well get their living, but will always be out of case.

Of a sheep spewing up it's grafs.

§. 2. Being at my fold, I saw my shepherd turn out a young sheep to be sold with the ewes. — I asked him why he did so; he said, because it spewed up it's grafs; and then he shewed me the outside of it's mouth and nose bedaubed with the green juice; such sheep, he said, would never thrive.

Of lambs drowned in the ewe's belly.

§. 3. My shepherd says, that the cause of a lamb's being drowned in the ewe's belly, (the ewe's being under a scarcity of water, and having dry mow-burnt hay) is, that by the greediness of the ewe's drinking when she gets to water, she gluts the lamb with the abundance of water she drinks. — Farmer Bachelour also believes it is so, yet says, that he has seen lambs with a watery humour, as if they had a dropsy.

§. 4. A sheep which is cored, after it has been ^{Of a cored sheep.} a year, or thereabouts, (for which time it may very well live, if chiefly fed with hay) will have a water-bladder, as big as an egg, under its throat, its eyes likewise will be white, and so will its mouth and gums.

If any sheep in a flock core in the winter, it will be easily seen at shearing-time; for such sheep will be poorer than the rest, and shew it that way by that time; and their wool will run into threads, that is, their wool will twist together at the ends, and look somewhat like teats: yet I have known shepherds say, that sometimes the wool of very sound sheep will be apt to run together into threads, and the finer the wool the apter so to do.

Mr. Bishop's shepherd caught a sheep that was cored the last year, and shewed me how it might be seen by the eyes of the sheep, they being in the valves and veiny parts, (and the eye-lids when turned up) milk-white; whereas the other healthy sheep, he shewed me, had eyes as red as a cherry. — He told me, some would say, thinness of wool on the breast was a sign of core; but he had had no regard to that saying; — that sheep that were so cored, being in a healthy country, and taking to eat hay, might live a year or two the longer for those reasons, but would never recover. — Note, this milkiness of the eyes shews that such sheep are far gone; they may be cored before they have that to shew: these cored sheep have the fluck, or plaice-worm in their livers, with which their gall is also full before they die: they call these worms a plaice-worms from their figure, which is like a plaice. — When they

* I am assured Dr. Nichols has lately communicated to the Royal Society several curious observations on the form and the nature of this animal, which will be publish'd in the next volume of their Transactions.

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look on a sheep's eye to see whether the sheep be cored or not, their term is, they will see how the sheep tests.

Of the rot. §. 5. Mr. Chestlin of Leicestershire says, that sheep when first touched with the rot will thrive mightily in fattening for ten weeks, but, if they are not disposed of when they are come up to a pitch, they will in seven or eight days time fall away to nothing but skin and bone; he has often had them die in the height of their pitch in half an hour's time with twenty-seven pound of tallow in their bellies.

Mr. Raymond, Mr. Biffy and I being together, Mr. Raymond said, that if the summer did not rot the sheep, it was generally agreed that the winter would not.— Mr. Biffy replied, that he had often heard the same; and so they agreed, that there was no danger of the extreme wet winter this year (anno 1702) rotting the sheep, seeing the foregoing summer had been so hot and dry as it had been — I asked Mr. Raymond, what he thought might be the reason of such a saying; he said, that a gloomy wet summer gave an undigested quick growth to the grass of cold land, which occasioned a rot among the sheep: and the said grass was in danger of continuing on in that unwholesome way of growing all the following winter, till the month of March, and the next spring came to give it a check, and the spring brought forth a new grass; whereas the power of the winter alone was not strong enough to begin a rot.

Marsh-tre. ^b Mr Ray speaking of marsh-trefoil, says, Sir
soil good Tancred Robinson commends it for dropical cases,
for the rot.

^b Dominus Tancredus Robinson trifolium paludosum in hydropicis affectibus commendat, seque sæpius observasse, ait, oves tabidas in paludes hæc herbâ abundantes compulsas, ejus esu re-stitutas sanitati. Ray, fol. 1099.

and says, he has known sheep, that have had the rot, drove into marshes where this herb has grown plentifully, and cured by it.

Mr. Boyle says, on the beginning of a rot among sheep, where it appeared, by the killing a sheep or two, that the whole flock were touched, a friend of his cured the rot by giving each sheep a handful of Spanish salt for five or six mornings together.

Mr. Raymond of Puck-Shipton in Wiltshire, says, that, when the meadows are slabby and full of water, they are then safest, and less subject to bane than they are in a dry winter.

John Earle, of Parks in Wiltshire, shewed me how the sheep had cropt and fed mightily on the broom: they will eat it heartily all the year, but especially in the spring, when it is in blossom: it stains their teeth as black as soot; we caught one, that I might be an eye-witness of it. — He says, he believes it will preserve sheep from the rot, and he shewed me twenty, that he had bought five or six months before, which, he said, were so rotten, that they would hardly drive home, but they were now recovered and grown fat, though the ground he had kept them in had hardly any pickings in it but what the broom afforded: he had another ground where the broom had been suffered to run to seed, and the sheep had not been in it above three weeks, before they had eaten all the kids up. — Broom, says Mortimer, in his book of husbandry, is one of the best preservatives against the rot in sheep: I have known sheep, when not too far gone in the rot, cured of it, only by being put into broom lands.

In Somersetshire they keep no flocks of sheep, for fear of a rot, it being a deep country; but are very glad of the opportunity of having the tails of the hill-country flocks: again, the hill-country farmers are glad to send their flocks thither for a month, after

their corn is cut, to feed on the stubble-grass, there not being there any danger of a rot.

The wood-evil. See Diseases in cows and calves.

§. 6. As to the wood-evil in sheep, I find Leicestershire is very subject to it: it is agreed that it is occasioned in May, and about Michaelmas, by bleak cold easterly winds; it falls chiefly on the lambs: if an ewe be in good heart, she will overcome it very well; but when it falls into their bowels, it is held incurable, nor could I find they had any medicine for it when in the limbs, but only time would wear it off. — One may perceive the distemper in them by their going lame, their necks, or some of their limbs will be drawn up altogether by it.

The staggers.

§. 7. The sheep-land at Appleford, in the Isle of Wight, is subject to the staggers: the chief remedy they find is, to drive the sheep to change of grounds often, to keep the grounds from tainting.

I observe lambs that die of the staggers, do not die of them so very young, as whilst they merely suck, suppose within the fortnight, but after they begin to eat grass, and of those the hopefulest and lustiest; by which I do conclude, that it is not the cold weather alone that brings the staggers, for then it would fall more on the lambs of a week and a fortnight old than on others, they being most unable to bear it: it arises therefore from their feeding on the cold watery grass in the months of March and April, which makes them abound with watery humours in their bodies, which the cold winds seize on and chill, and bring those cramps and aches into their limbs. It is observed this disease is much prevented by early folding of the lambs, and with good reason, for thereby in the cold nights the lambs are kept warm, and also prevented from eating so much grass as otherwise they would, whereby such watery humours are fed. — Quære, whether our cold country may
be

be proper for fattening of lambs till towards May, when the sun has got a full power.

§. 8. In opening the sheep's skull for the giddi-^{The giddy or giddiness.}ness, it may be discovered where the bag of water lies, by the thinness and softness of the skull, and so to know in what place to open it, for it will bend under one's finger. — A farmer at Upcurn told me, if the bladder lay under the horn, there was no coming at it.

I am informed also, that the bladder under the horn or skull, which makes beasts giddy, never falls upon any sheep above the age of a hog or a thief; nor upon any bullock after two years old.

§. 9. Some years the sheep will be apt to be taken with a disease they call the shaking; some farms ^{of the shaking.}are more subject to it than others: it is a weakness which seizes their hinder quarters, so that they cannot rise up when they are down: I know no cure for it.

This shaking, as I observed, is incident to some farms, inasmuch as some years an hundred of a flock have died of it: neither Mr. Oxenbridge, Nat. Ryalls, nor Mr. Bishop's shepherd knew of any cure for it. — But they said that horses going with sheep are apt to cause it, and so are briery hedges growing out in the ground; but that milch-kine and goats going with the sheep were good against it. — Farmer Bartlet who rents 800 l. per annum of Mr. Freck, whose farm was subject to it, would pick out a sheep presently that had it.

§. 10. Mr. Lewis of Broughton informs me, the ^{Of blindness, and of the green scouring.}sheep of that side of Wiltshire are not subject to the shaking, nor to the white scouring: as for the green scouring, either in sheep or bullocks, he says, verjuice is beyond the oak-bark, and a more certain cure; a wine-glass full is enough for a sheep, and a pint for a bullock. — He says, that about his part

of Wiltshire, the sheep are troubled with a blindness; their cure is anointing their eyes with goose-dung.

The over-
flowing of
the blood.

§. 11. Mr. Bishop's shepherd says, he can presently see if any of his sheep are sick by the dulness of their countenances, and their looking still forwards: but he knows of nothing to give them in such case, unless when they are sick with the overflowing of the blood, which is about Michaelmas; it comes from high feeding, and a quick shoot of the grass, and then he bleeds them either in the eye-vein or tail-vein, and takes more or less blood from them, as they seem to be more or less infected. — When he bleeds them in the tail-vein, he lets it bleed till the blood stanches of itself: but when he has a mind to stop the eye-vein, it is only holding his thumb on it a little while. — He says, he approves of bleeding them in the eye-vein, but he never knew any body to do it but himself.

I asked him again about his bleeding his sheep in the eye-vein and the tail-vein for the overflowing of the blood about Michaelmas; for another shepherd had said, he only knew the hog-sheep to be subject to it: but the shepherd says, it is true, the hogs are most subject to it, and apt many times about Michaelmas to die of it; but yet he says, the ewes and weathers will sometimes have it.

Of scour-
ing.

§. 12. The sheep in this country about Crux-Easton are little troubled with scourings. — I asked my shepherd how that distemper came; he said, by a quick shoot of the grass in the first hand of the spring; but it was easily cured; for, when they found it, they brought them to their hay again, and that stopped it: but he said, in the vallies, and some places where the weed grunsel grows, the sheep are much troubled with it.

I shewed an experienced farmer a lamb which scoured, having had no vent but what the shepherd cut.

cut.—He said, by all means, if it can live, fat it off; for he never knew such a lamb live to be a sheep; it would always need fresh cutting and opening.

Mr. Smith, of Deadhouse, says, that broad-clover is more apt to scour sheep or other cattle than hop-clover is, and that they are both more apt to scour than natural grass, and consequently not so proper as other grass to raise a beast or a sheep in fat; that a beast, cow, or sheep, if they scour but one day, will lose more flesh than they can get again in a fortnight; that, when sheep or lambs scour, if you cut off the ends of their tails, it will stop the scouring, so that they will scour no more that season.

I told Mr. Bishop of Dorsetshire, of the rind of the oak that lay under the bark, to cure the scouring of sheep: he knew nothing of it, but said, the distemper came from a quick growing of the grass in the spring, and that they looked on it that their sheep would not thrive in the fore hand of the year till they had had it; but that scouring at other times of the year was mortal, and that he knew of no cure for it; and that their scourings then would be of a nasty white sort of matter.

Vide Diseases in cows and calves, §.

His shepherd says, all sheep will have the skenting in the spring; if they have it in the winter they look on it as unseasonable: the white skenting or scouring is very rare in sheep: it happens oftener to the lambs, and very seldom are they recovered of it: he knew a lamb of their flock, he says, recover of it last year, (anno 1696) but when they do, they will afterwards peel all over.

When I told Sir Ambrose Phillipps's shepherd, that verjuice was good to give beasts for the scouring: he said, he did not think so well of that way, either for sheep or cows, as to give a purge: in such

case, he says, he gives one groat's-worth of cream of tartar, two penny-worth of aloes, a penny-worth of fennigreek-seed, a penny-worth of turmerick, or a farthing or half-penny-worth of long pepper in a quart of warm ale, for a cow; but of these ingredients, mixt together, and put into such a quantity of ale, he would not give a sheep above two spoonfuls.

Of the
red-water.
Vile red-
water in
cows and
calves, §.
10.

§. 13. One of the chief distempers in sheep is the red-water, of which not one in a hundred ever recovers: it is thought to come by feeding on sour grass; if it seizes on a fat sheep it will be worth nothing but the skin, for, if you boil the flesh for the tallow, it will stink all over the house in a strange manner: this distemper is aptest to seize on those sheep and lambs that are best in proof.

I asked a farmer in my neighbourhood, who keeps a very large flock of sheep, and has had long experience in them, what he thought to be the occasion of the red-water; he answered, a quick growing of the grass in the spring, and a too quick thriving of the sheep upon it, but he admitted it not to be curable. An old and very understanding shepherd afterwards assured me, that it came only on the sheep when they were out of condition, and weak, and fell first on the spring-grass, especially if it were sour. — He said, before it is long gone they are easily cured by giving them the inside rind of the bark of oak, but as for hay, when they are in that weak condition, they will not eat it. — Three or four little pieces will do, if one makes them chew and swallow it: he says, the chewing it has often stopped a looseness with him.

I had much discourse with an Irishman (anno 1700) who seemed very sensible in husbandry, and talking with him about the diseases in sheep, he asked me, if I knew any cure for the red-water; I said, no, I thought it incurable. — He said, in
Ireland

Ireland they had of late found out a remedy, which cured many though not all; it is as follows; when you find the sheep's breath to stink, which will shew itself in the red-water, take two quarts of brandy, and two gallons of tanner's owze, that is, the liquor out of the tan-pit, with the lime-bark, and the washings of the skins in it, and mix the brandy and this liquor together; then take an hen's egg and blow it, and take off the top of the shell, and fill it with the liquor, and put it into the horn; this is the quantity to be given to each sheep, but if a sheep be very weak, then lessen the quantity; though the medicine be not infallible, he has cured, he says, many in his flock with it.

With us they usually give the sheep the following drench for the red-water, or rather to prevent it. If it be for a score of hog-sheep, then about this proportion, a spoonful of bole-armoniac, a spoonful of the powder of ginger, a handful of rue, a handful of red sage, and about a quart of water to be boiled to a pint, give three spoonfuls to each sheep.

Sir Ambrose Phillipps's shepherd says, to prevent the red-water in sheep, he always bleeds them twice ^{Id. and of} ^{blindness.} a year in the tail-vein, at Michaelmas, and in the the spring, and two or three times in each season, bleeding them as he sees occasion, that is, as they seem more or less to rise in proof: he takes four or five spoonfuls of blood at a time, from his whole flock round: he prefers bleeding in the tail to the eye-vain, both for the red-water, and the shaking, which his sheep are subject to. — But he confesses, for the red-water, when it has seized on the sheep, he knows no cure. — He says, garlick steeped in new milk is said to be extreme good to prevent the red-water, given twice or thrice, a spoonful at a time. — Sir Ambrose's sheep, he tells me, are

troubled much with blindness, which begins after the shearing-time; they have a white film over their eyes; he cures them, he says, with eye-water made of allum and vinegar.

Of the
stone.

§. 14. Common dog-grafs, quick-grafs, or couch-grafs, ‘Mr. Ray says, is a cure for sheep and black cattle when they are afflicted with the stone, which they are apt to be in the winter and spring. He quotes Fran. de la Boe, and Glisson for his authority; but I must enquire farther of this, for neither the *Rei rusticæ scriptores*, nor Worlidge, nor Markham, do observe in oxen or sheep such a distemper as the stone.—My shepherd says, he has known a white round stone in the neck of a sheep’s bladder, of which it died.

Of blind-
ness.

§. 15. My shepherd came to me in July (anno 1701) and told me, I must get better grafs for my sheep, for a great many of the lambs were blind or going to be so: he said, a scum grew over their eyes, which, as he had observed, usually happened at this time of the year, in case they pitched, or sunk in flesh by short commons; and that my weather-lambs were most subject to it.—I told him that might be because they were but lately cut, so they must be subject to sink on that account.—He said, that might be something, but when the grief of that was over, it was the same as before; but ewe-lambs and ewe-hog-lambs, and ewe-hog-sheep, and old ewes, were hardier than the weather-sort, and would bear the winter better.—I asked him, if there was not some other cause of their growing blind, for I had heard of others; he said, yes, he knew of one more, and that was all; in wet and growing years,

• Oves & boves calculis vexati in hyeme & verno tempore liberantur a recenti gramine canino. Ex Observ. Fran. de la Boe, p. 300.—Idem jampridem observavit dominus Glissonius. Ray, lib. 2. fol. 1255.

when

when the sheep fared so well that they could not keep the bennets down, they would be apt to get into their eyes, and blind them for some time. — Note, if the ewes be the stronger and hardier constitutioned creatures than the weather-kind, this gives some account why the ewe-fold should be better than the weather-fold, that is, manure the land better.

Sheep's eyes will often run with water, and be blind by feeding too much in the wheat-stubble : the cause is, the wheat-stubble runs into their eyes. — This I have heard shepherds say before, and my shepherd assures me it is true.

Sir Ambrose Phillipps's shepherd agrees that goose-dung is good for blindness in sheep.

In the Isle of Harries, the natives pulverize the * *sepia*, which is found on the sand in great quantities, with which they take off the film on the eyes of sheep. Martin of the Western Isles, fol. 38. * Cuttle-bone.

A quantity of wild sage being chewed between one's teeth, and put into the ears of cows or sheep that are blind, they are thereby cured, and their sight perfectly restored ; of which there are many fresh instances, both in Skie, and Harries islands, by persons of great integrity. Martin, fo. 181. — Wild sage chopped small, and given to horses with their oats, kills worms. ib. 182.

§. 16. The sheep near Loughborough are mightily troubled with the loore or foreness of the claws, and so are the cows ; sometimes an hundred sheep in a flock shall be down together, and so troubled with it that they will be forced to feed on their knees ; and many times the cows, for want of good management, never recover it, but continue always lame, and grow club-footed : verdigrease and hog's lard is a good medicine for it ; and some use aquafortis for it. The loore. Vid. the loore in cows and calves, &c. §. 19.

For the fowle or loore in cattle, the best method is

is to take two penny-worth of allum, two penny-worth of arsenic, one pint of wine-vinegar, and two quarts of spring-water; boil the water till it is half gone, then pound the powders small, and boil all together. — This distemper breaks out between the claws of a beast or a sheep, with rottenness and stink: before you dress the sore, you must pare the claw so far as it is hollow, then put so much of the liquor as will run all over the sore; the foot must be dry when it is dressed, and kept so an hour: in once or twice dressing you need not doubt of a cure.

The scab.

§. 17. I saw Sir Ambrose Phillipps's shepherd dress the scabs in his sheep, and he shewed me how to know where the scab was not killed after dressing; for where the scab was alive, there in the dressing and rubbing it would itch, which would make the sheep mump and nibble with their lips: he said, it was not good to let the sheep-water be too strong, it was better to have it of a moderate strength, and to dress the same sheep twice, than to think to kill the scab at once, especially if the sheep be pretty far gone with it; for it will make them grievous sore: the sheep, he said, had the scab very much when he came first to Sir Ambrose's, and he thought to cure them the sooner by making the water strong, but he harmed them by it; for it made some of them so sore, that for three days and nights together they would lie down, and only feed round about them without rising. His sheep-water is made of tobacco, and the liquor of salt-beef, and sometimes he puts soap-suds to it.

I told a Leicestershire farmer, I observed two or three of his sheep to break out, and grow scabby on the back. — He said, it was true; but he dared not to meddle with them then, it being in January (anno 1698, because they were big with lamb, for fear of squatting their lambs.

An

An old shepherd of Derbyshire told me in September 1697, there was lately discovered a better medicine for the scab in sheep, than tobacco, and salt, and the murrain-berry root, viz. ^d a quart of spring-water with about half an ounce of quick-silver in it, boiled to a pint : and once anointing of the scab with it would cure it.

The gundy or foulness of the tail, shoulder, or breast in a sheep, is a sort of itch that comes with over-heating by over-driving, or double folding them, and to rams, by heating themselves with the ewes : it is cured by dressing with sheep-water, made of tobacco, salt, and murrain-berry root, boiled in human urine, or water, three or four hours : half a peck of salt, and three pounds of tobacco, and a hatfull of roots, to a barrel of water or urine.—If it runs on after Michaelmas, when wet weather comes, it is hardly to be cured all the year, nor is it to be washed in wet weather.—The good quality of a shepherd is, to discover this distemper ere the wool be broke by it.

Mr. Bishop's shepherd says, when the gundy or scab in sheep first appears, it is a boyl no bigger than the top of one's finger, and may be discovered in a sheep by it's standing still, and wriggling, as if feeling after the itch.

When my shepherd uses the sheep-water, to kill the scab, he shears off the loose wool they have raised with rubbing, by clipping it as short as the other wool, that by the breaking of it again, he may know whether the scab be cured or not.

He says, nothing will sooner give the sheep the

^d A gentleman of Hertfordshire communicated to me the following remedy for the scab, which, he says, has been used with good success in that country. An ounce of white mercury, and two ounces of stone-vitriol ; dissolve these in three quarts of water boiled in a glazed earthen pot, and wash the part affected with this liquor.

scab, or breaking out, than hunting them on nights, and heating them before they are folded; whereas, on the other hand, before the ewes are half gone with lamb, or when they are not with lamb, nothing is better, when they are turned out of the fold in the morning than to drive them a little; it will set them which have any stoppage on coughing, whereby they will force the phlegm through their nostrils.

The maggot.

§. 18. Sir Ambrose Phillipps's shepherd, for the maggot, lays the juice of elder, and the juice of arse-smart to the fore.

In discoursing with an old shepherd about the maggots in sheep, it being in July (anno 1697) he said, if they fell upon the back, or woolly part of the sheep, a good shepherd would be careful of the wool, and not cut it off, but take the maggot out, and rub bruised hemlock, or bruised elder upon it, and all over the body upon the wool, which would keep off the flies.—— An hour after discoursing farmer Elton's shepherd, he said the same, and farther, that, if the maggot was in the tail, he would cut it out, and rub hemlock and elder upon it, but not tar the tail.—— I told him, I had seen the tail tarred: he said, then it was by a young shepherd that understood not his business; for it would not come out, but spoiled the sale of the wool.—— He said, the plains were little troubled with the maggot, the flies seldom coming there.—— Afterwards discoursing with a third shepherd, he said, at this time of the year, and after shearing-time, he used tar to the tails, for the maggot, but not before shearing time, for, said he, it would now wash out again by the weather.

If a sheep has the maggot, it will be sick and pine, and creep into the hedges: the cure is fallad-oil, or fresh butter mixed with tar, and made into an ointment.

My

My shepherd was saying, that an ewe-fold required more trouble and care to look after it than a weather-fold did.—I asked him why; he said, ewes and lambs were much more subject to the flies and worms than weathers were; because ewes could not be sheared so close as weathers, on account of their teats; and ewes and lambs were much more subject to scour than weathers.

§. 19. Mr. Bishop's shepherd told me, that it was ^{Of lice.} natural to some sheep to be lousy, let them be never so well kept, but poverty would greatly increase the lice: if a sheep was subject to be lousy, they usually put such away, though otherwise never such good sheep; for it was odds but their lambs would be subject to it too.

He added, it was easy to see whether sheep were either scabbed, or lousy, or not; for the scab, when it first appears, pitches in one single patch, from which the sheep will rub, or bite off the wool: but when they have lice, sheep will be raising and thinning their wool, by rubbing their horns on it, and biting it off in many places: the best thing he knows of to kill the lice, he says, is goose-grease; and to cure one sheep will take a quarter of a pound.

In shearing-time, I observed many lice in the sheep; and I was told, that, if those sheep were sheared, so that the crows and magpies could come at the lice, the sheep would in a week's time be rid of them.

It being an extreme wet winter (anno 1707) wherein we had scarce any frost; I observed to my shepherd, that the wool of my sheep staved very much.——He said, that was occasioned by their sucking their wool, by reason of their lice, with which this winter had filled them full; for, said he, it is wet that breeds lice, and makes them increase, nor is it to any purpose to search their fleeces, or to
medicines

dus) and he will last very well to his twentieth year.—If the mare cast her foal, or should foal with difficulty, he prescribes a drench of polypodium, bruised, and mixed with warm water; but, if she brings forth easily, he particularly cautions us by no means to assist the birth with our hands (nor handle the young for some time after they are brought forth, says Palladius) as the least touch may be an injury to the foal.

The mare should not take horse till she is two years old, nor after she is ten; for when past that age she will bring a weak and unprofitable breed: in this he agrees with Varro. She should not be suffered to breed oftener than every other year, that she may keep her milk the longer to bring up her foal, which should suck two years.—Colts ought not to be broke till they are two years old, according to Palladius (but Varro says, till they are turned of three; if for domestick uses, says Columella, at two years old, for the race, &c. not till after three.) He orders horses to be cut in the month of March, which he also says is the proper month for covering, but Varro speaking of the latter, says, any time between the vernal equinox and the summer solstice.
* According to these writers, if you intend your horse

* Equos ad admiffuram quos velis habere, legere oportet amplo corpore, formosos, nullâ parte corporis inter se non congruenti. Varro.—Cum vero natus est pullus, confestim licet indolem æstimare, si hilarius, si intrepidus, si neque conspectu, novæque rei auditu terretur, si ante gregem procurrat, si lasciviâ & alacritate, interdum & cursu certans æquales exsuperat; si fossam sine cunctatione transiit, pontem flumenque transcendit: hæc erunt honesti animi documenta.—In formâ hoc sequemur; ut sit exiguum caput & siccum, pelle propemodum solis ossibus adhærente. Palladius;—brevibus auriculis, argutis, arrectis, applicatis. Var. Columella, Pallad.—nigris oculis, Col. & magnis, Pal. naribus apertis; cervice latâ nec longâ; densâ jubâ, (& fuscâ, Var.) & per dextram partem profusâ, (latè patenti, Pal.) & muscutorum toris numerofo pectore; grandibus armis

horse for a stallion, you should endeavour to procure one that is full sized, and beautiful, and well proportioned. His nature and disposition, even when a foal, may be soon discovered, by his liveliness and intrepidity; by his betraying no fear at the sight or sound of things he is unaccustomed to; by his being the leader of his company, more wanton and playful than the rest, and sometimes making trial of his speed with them, and excelling them in the race; by his leaping the ditch, passing the bridge, or plunging into the stream without hesitation: all these are presages of a generous and noble spirit. — His make and shape should be as follows; — his head of the smaller size, and lean, the skin just covering the bone; his ears little, picked, upright, and close to his head; his eyes black and large; his nostrils wide; his neck deep, and not over-long, with a thick dark-coloured mane flowing on the right side; his bosom deeply spreading, and very muscular; his shoulders large and strait; his sides rounding inward; his back-bone broad, and, as it were, double, but at least not prominent; his belly of a moderate size; his loins broad, and sloping downward; his buttocks round; the muscles of his thighs visibly numerous and protuberant; his legs strait and equal; his knees round, not big, nor turning towards each other; his foot neat and firm,

armis & rectis; lateribus inflexis; spinâ duplici, (sin minus non extanti; ventre modico, Var.) latis lumbis & subsidentibus, (deorsum versum pressis, Var.) rotundis clunibus; feminibus torosis ac numerosis, Col. cruribus rectis & æqualibus; genibus rotundis, ne magnis, nec introrsus spectantibus, Var. pede sicco, & solido, & cornu concavo altius calceato, Pal. cui corona mediocris superposita sit; caudâ longâ & setosâ crispâque, Col. vassum corpus & solidum; robori conveniens alti-udo; mores, ut vel ex summâ quiete facillè concitetur, vel ex incitatâ festinatione non difficillè teneatur, Pal. de stripe magni interest quâ sit, Var.

hollow hoofed, and not low heeled, with a small coronet on the top of it ; his tail long, full, and wavy ; his whole body large and compact ; his height proportioned to his strength ; of so manageable a temper, as to start forth at once on the least encouragement, and be stopped without much difficulty when at full speed.— Great regard must be had to the race he comes of.— Palladius has added also a list of the colours they most approved ; but we choose, says he, a stallion of one true colour, and reject the rest, except a multitude of other perfections atone for this defect. ^b I have only one observation to add before I close this section, which is, that the characters of a fine horse given us by Virgil and Columella are in so many particulars the same, that the latter undoubtedly copied from the former.

§. 2. The tenth commandment forbids us, to covet

^b 1 Primas & ire viam, ² & fluvios tentare minaces
Audet, ³ & ignoto sese committere ponti ;

⁴ Nec vanos horret strepitus.— Illi ardua cervix,

⁵ Argutamque caput, ⁶ brevis alvus, ⁷ obesaque terga ;

⁸ Luxuriatque toris animosum pectus.

⁹ Densa juba, ¹⁰ & dextro jactata recumbit in armo ;

¹¹ At duplex agitur per lumbos spina.— Virg. Georg. lib. 3.

¹ Ante gregem procurrit, ² pontem ³ flumenque transcendit.

⁴ neque conspectu novæque rei auditu terretur.— ⁵ Exiguum caput, ⁶ substrictus venter, ⁷ lati lumbi, ⁸ musculorum toris numerosum pectus, ⁹ densa juba, ¹⁰ & per dextram partem profusa.

¹¹ spina duplex. Columella.

¹ The first to lead the way, ² to tempt the flood,

³ To pass the bridge unknown.—

⁴ Dauntless at empty noises ; lofty-neck'd,

⁵ Sharp-headed, ⁶ barrel-bellied, ⁷ broadly-back'd ;

⁸ Brawny his chest, and deep.

⁹ On his right shoulder his ¹⁰ thick mane reclin'd,
Ruffles at speed, and dances in the wind.

¹¹ His chin is double. —

Mr. Dryden's Translation of the third Geor.

vet our neighbour's ox or his afs : it is probable the horse is not mentioned, because there were but few horses among the Israelites till Solomon's time. — So also, *Exod. xiii. ver. 8.* it is appointed for every firstling of an afs to be redeemed ; Bishop Patrick says, there was the same reason for horses and camels, but an afs is mentioned, because there were plenty of them, though but few of the others.

§. 3. Mr. Clerk of Leicestershire assures me, that if I buy colts of two years old, I may begin to work them gently in the plough, and at harrowing-time : and that, if I laid out twelve pounds, which he would advise me to do, rather than but ten pounds on a colt, by the time he came three years old, he would very well earn his meat. — This, he

Of buying
colts for
the plough.

The above characters given us by Varro, Columella, Palladius, and Virgil, according to our author's remark, seem principally to relate to those horses that were designed either for the manage or the chariot-race ; observing however that these characters are not sufficiently distinguished, but too much blended with each other, he has taken from all of them together what he thought made a proper and uniform portrait of a fine horse, in which, it appears to me, he has an eye to the war-horse only. — The like want of preciseness in distinguishing one kind from another, was perhaps a fault not uncommon among the antient writers on husbandry, and may particularly be seen in Varro, who, under the article — *de Bubus & Vaccis* — has given us a description that, taken in the whole, is suitable to neither ox, bull, nor cow, but has somewhat that relates separately to every one of them, at least in the judgment of our present graziers, and dairy men. I know no one that has distinctly characterized the various sorts of horses, excepting it be our countryman Mr. Dodsley, who, in his Poem on agriculture, having first spoken of those that are proper for the draught, and the road, has so well described the hunter, and the war-horse, that, if Mr. Lisle's book were not intended merely for instruction, I should have been tempted to have inserted some lines of it in this note, for the reader's entertainment ; I take the occasion however of recommending it to him, as, I think, it has been less taken notice of than it deserves, and as I wish the author may find encouragement to pursue his plan, and oblige the public with the two remaining books he at first proposed.

said, was the practice of all Northamptonshire, viz. to buy their colts at that age, and by the time they came four, to sell them off for the coach. — He assured me, they would be presently gentle, by being wrought two or three times with other horses; and that their food should be oats in the straw, and barley in the straw.

He says, that colts of two years old will very well do two, or three days work in the week at the plough, and at harrowing; but in Leicestershire they do not plough so hard as with us in Hampshire.

Of keep-
ing mares
for breed.

§. 4. Being at Appleford in the Isle of Wight (anno 1711) farmer Farthing was speaking of his mares, that he chose rather, for sake of breed, to keep them than geldings, and that he had a stallion for that purpose, which went in his team. — I asked him, how he could manage that matter so as to keep his stone-horse quiet, and free from unluckiness, and within inclosures; he said, he kept no geldings; for whenever a gelding came into the field or the stable with the mares, the stone-horse would immediately be biting the mares, and kicking the geldings, but would go as gentle as possible with the mares by themselves: then, said he, that he may not break over hedges, we always fetter him with a mare, and so he will be easy. — I replied, if he went with the mares, he would be apt to spoil the mare he went with, by leaping the other mares, which would endanger the putting out the shoulder of the mare with which he was fettered. — He said, he made the links so long that there was no danger of that; for the stallion often leaped other mares in the field, whilst he was fettered to a mare, without any inconveniency.

It is profitable to keep mares for foaling: the only inconveniency in them is, that their foals must come in March or April, or be worth but little;
and

and then such mares can do but little service in barley-feed-time: but afterwards you may work them as much as the other horses.

§. 5. I bought colts of two and three years old, and put them into the woods, from whence they broke out and strayed: the farmer said, I should have kept them in the meadows till they had been acquainted, before I had turned them into the woods. — I replied, it being then the beginning of December (anno 1700) that the meadows would have made them so sweet-mouthed, they would not have endured the woods. — The farmer said, the meadows at that time of the year would not make them fine-mouthed, but he granted the hop-clover grounds would.

Of keep-
ing colts
in woods.

§. 6. I was saying to farmer Parsons of Northamptonshire, that I intended to keep mares, and to breed: this was anno 1701. — He cautioned me not to do as many did, viz. keep up the foals from the mares, and only let them suck morning and night, before the mares go to, and when they come from work: this will spoil both the mare and the foal; for the mare will fret, and her milk being pent up will over-heat, and that will surfeit her foal: whereas a mare should do very little work, but go with her foal at grass, till the foal is fit to go after the mare, and then it is best for the foal to follow the mare at work, and to suck a little at times. —
Columella in part lays down the same rule.

Of keeping
mares for
breed:
and of
colts.

§. 7. If your grounds are bounded with good hedges and ditches, it may be convenient to keep a few colts to eat up the offal hay, the waste and offal of the sheep.

Of keep-
ing colts.

Columella speaking of sucking colts, says, cum firmior erit, in eadem pascuâ, in quibus mater est, dimittendus, ne desiderio partus sui laboret equa; nam id præcipuè genus pecudis amore natum, nisi fiat potestas, noxam trahit. — Therefore it seems farmers allow the sucking colts to follow the mares by their sides in carting.

Profit
from horse
dung, &c.

§. 8. It would be no paradox to assert, that, whereas a brace of saddle-geldings at London, cannot be kept for less than 50 l. per annum, yet the same geldings, in the country, may, by a gentleman, who keeps land in his own hands, be kept in a manner for nothing: or in other words, every horse in the country is worthy of his meat. Two geldings will give twenty-four load of dung in the year, which will nobly dung an acre of ground; this acre, modestly speaking, will bring four crops, equivalent to four quarters of oats per acre per annum, and a new acre is to be dunged yearly, so there will soon be the produce of four acres yearly, to be accounted for in the same proportion, for the maintenance of these two horses; and will also pay for the rent of the ground, seed, and ploughing, for three bushels per week will maintain them. And the like computation for the yearly produce of four acres of clover, enriched by the manure, shall nobly maintain your two horses in hay and grass.—— In the same manner may the bread-corn for a family be provided for almost nothing; for, in my family, that spends a bushel and an half of wheat in a day, and burns ten chaldron of coals per annum, besides wood, I have from thence at least twelve dung-pot loads of ashes in the year; and from garbage and dust, and washing of the kitchen, brew-house, and milk-house, at least twelve loads more, which is yearly noble manure for one acre, each of which acres will, modestly computed, produce equivalent, for four years, to sixteen bushels of wheat per acre, and four times sixteen is sixty-four bushels.— Your grains also, and your pot-liquor devoured by the pigs, produce some loads of dung, nor ought the pigeon-dung to be slighted.— And the sown-grasses in each acre holding two years, eight acres of grass are yearly to be accounted for on the score of the
the

the manure arising from the two horses, and eight acres on the score of the house-manure, in all sixteen acres, four of which will provide hay for the two horses, another four acres will fat forty-eight sheep, that is, six sheep per acre, twice in the year, and the other eight acres will fat twelve cows for the house.

§. 9. In our hill-country we ought always to have a consideration to the pasture-grounds we reserve for our cart-horses in summer, so as to be able at least to allot pasturage for them under good shelter, in cold, windy, or rainy nights; for warmth at such times is of as much regard as their food.

§. 10. Speaking of the great expence of keeping stone-horses in the house, my bailiff assured me, that stone-horses kept in the house in barley-feed-time would not be kept up in flesh by oats, without peas or barley.—I replied, that I thought barley might give them the fret. — He said, if it did heat them, as it would be apt to do, the carters would, unknown to their masters, clap barley in an old sack into the pond for a night, and take it out early in the morning, and would give them of this half malted, and it would cool them again; he said, in feed-time, when the carters would be giving them barley, it would, as I said, heat them, and, when they had been heated, one might perceive it, by their gnawing and eating the earth when they could come at it.

§. 11. I have heard many carters say, that when a horse is out of condition, and hard worked, no quantity of oats will make him thrive; for his work will lie so hard upon him, being out of case, that it will keep him low, give him what meat you will: but a horse in case may easily be kept up with less meat, notwithstanding he is worked.

§. 12. Farmer Isles of Holt, Wilts, assures me, that peas-straw, or peas-halm, if well housed, is

the best and heartiest fodder for cart-horses, beyond barley-straw, or middling hay, and the horses will eat it better, nor does it scour them, nor give them the fret. — I was surprized at this account, because in our hill-country we seldom give peas-halm to horses, nor do the cow-cattle much care for it, for they will but pick on it a little; which makes me suspect, that, as in other cases, so in this, the peas-halm in our cold hill-country is not so sweet as in the vale, but of a sour juice, and the cattle will pick but little of it, be it never so well housed. — William Sartain says the same, but adds, it will be apt to make horses, if they be held to it, piss high-coloured water.

In Leicester-
shire.

I find the usual method in Leicestershire is to give their horses peas-straw, and they care not how little barley or oat-straw they give them: they think the peas-straw to be more cooling, and more heartning, and less binding than barley-straw. — They seldom give oats in provender, but peas or beans mixt with wheat-chaff, or barley-chaff.

In Hants.

I was telling some of our Hampshire farmers, that in Leicestershire they gave their horses peas-straw, and thought there was more strength in it than in any straw-fodder, and valued it the most: whereas I observed, they in Hampshire made little esteem of it, and flung it to the dung-heap. — They replied, that they looked on it too as a very hearty straw, but it was likely that, when I observed they flung it away, the year must have been bad, and it had been ill housed; but, said they, the straw as well as the peas, if not well * hinted and dried, are dangerous to give to a horse, which is the reason we the seldomer give it them in this country.

* Well put
up toge-
ther.

Winter-
vetches for
horses.

§. 13. Take care to have a good store of winter-vetches between the latter end of August and the beginning of November; for the old straw being then

then gone, and the new not ready, and the grafs almost at an end, they will be a great support to your horfes.

I observed in the Isle of Wight in May (anno 1699) that, after feed-time, the farmers baited their horfes sometimes with grafs; for it seems, the fodder by that time has but little goodnefs in it.— In our part of Hampshire, againft that time, the farmers ufe to lay up fome winter-vetches and peas for their horfes, to help out with the drynefs of the ftraw, and to give them a bundle after watering-time, morning and evening: but peas and vetches in the ftraw are by no means counted wholefome till after Candlemafs, when they have sweated in the mow; for if they be given fooner, they often give the horfes the fret; the drier the peas and vetches are in the ftraw it is counted the better. — They generally referve the greateft part of the peas in the ftraw till feed-time, and then they give them the horfes, to cool their bodies after hard working.

To have winter-vetches in reek againft barley-feed-time, is as good husbandry as to have them againft the beginning of winter, when there is no ftraw, and the grafs is pretty near gone; for before barley-feed-time the ftraw is too dry for horfes.

§. 14. This year, 1704, was a mighty dry year, Of goar-
and confequently goar-vetches the fafer to be given vetches.
to horfes: our carters gave our horfes of them very freely, they being very dry and good, and I had fix acres of them: but they filled my horfes very full of blood, and one of my coach horfes fell down dead in his harnefs; his blood being a little heated by driving, and too thick to circulate, burft the veffels: therefore to drive them leifurely, if full of blood, is beft, and, let the goar-vetches be never fo good, give the horfes dry meat every third week.

§. 15. I

Winter-
vetches.

§. 15. I asked Mr. Bachelour of Ashmonsworth, how it came to pass, that winter-vetches were not thought proper in the halm, unless the weather were very dry; seeing, if they were well hinted, as mine this year (1700) were, without taking wet, and had well sweated, I saw not how a wet day could affect them; he replied, that their halm was loose and spongy, and would give in damp weather, though in reek, which would be apt to give horses the fret.

Of hay
and chaff
mixed.

§. 16. Farmer Knap of Burclear gave his horses hay and chaff, but no straw, and does assure me, that he allowed his horses winter and summer but one bushel of oats a piece per week, and one bushel of beans per week amongst six of them. In the eight winter and spring months he saved six bushels of oats per week, which comes to twenty-four quarters, and at 14 s. per quarter, makes 17 l. — but then for the four quarters of beans to be discounted for at 20 s. per quarter, the oats saved will be but 13 l. — The hay the six horses will eat in the eight months will be twelve loads, which cannot be valued at less than 18 l. — So that this way of farmer Knap's is worse by 5 l. per annum, than the common allowance of oats with straw, only he has saved all his straw, which cannot be worth much more than 5 l. — Therefore this way of farmer Knap's seems to be a proper sort of husbandry in the vale, where hay is plenty, and their land too good for oats; for farmers are very unwilling to buy oats, though they come cheaper than hay, but always make the product of their own farm serve all occasions; thus few farmers will buy beans for their horses at the same price they may sell oats: it is also a good way, where, in the hill-country, a farm grows more French-grass-hay than the farmer can get chapmen for.

§. 17. Oats

§. 17. Oats being very dry in April (anno 1707) I thought it would be cheaper to feed my horses with barley; so I proposed it to my carters: but they were all against it, and said, the time of the year for that was over; for, if I gave them it during the summer, it would heat them too much; the season for that was in the winter. — But quære why they give horses barley in the hot countries.

§. 18. In discourse a out feeding of plough-horses, several farmers allowed dry peas or vetches to be very hearty and wholesome for them, provided they had sweat well in the mow, otherwise very improper. — And one of them asserted, that four bushels of peas, mixt with oats, would go as far as a quarter of oats.

§. 19. In Leicestershire they hold it very improper to give horses chaff and oats together; for with the chaff they will be apt to swallow the oats whole.

§. 20. The Loughborough carrier gives his horses no oats, and but very little hay: he gives them, when at Loughborough, oat-hulls and beans; viz. after the proportion of a peck of beans to a bushel of hulls: a quarter of a peck of beans to a peck of hulls he thinks enough for one horse at a time: he says, with this feed, when at Loughborough, seven or eight horses, from Friday-noon to Tuesday-noon will eat him up but three, or four hundred pound weight of hay, which is at most but sixteen todd: his oat hulls cost him 2d per bushel: so then, if a plough-horse has two baits in the day, he will eat half a peck of beans, which at 6 s. per bushel, will come to 9d.—and the hulls a penny.

§. 21. At London the said carrier gives his horses only beans and bran; viz. a bushel of beans to two bushels of bran: but there he gives them hay, because he must pay for it, whether they eat any or not.

§. 22. In

New peas
give
horses the
fret.
Id. peas-
chaff.

§. 22. In carting of peas in harvest, horses should be kept from eating them; they are apt to give them the fret.

I gave my horses peas-chaff in October, and it gave two of them the fret the second day. Note, this was too early in the year to give them peas-chaff, which, when given ought to be the chaff of peas well housed.

Of clean-
ing chaff.

§. 23. Mr. Bayly of Wick advises me by all means, to prevent surfeiting my horses, and breeding distempers in them, to see my chaff well cleansed from the dust in the barn before it is brought into my chaff-bin in the stable; for, when the chaff is carried foul to the bin, the carters are many times careless, and in haste, so that they give it not proper, nor indeed any cleansing, which is very pernicious to a horse, and the dust and dirt binds up his body.

What chaff
best,—also
what al-
lowance
for a horse.

§. 24. Mr. Edwards says, barley-chaff is accounted better than wheat-chaff, the common price of which is 2s. 6d. per quarter, and a bushel of oats per week to a cart-horse with this chaff is accounted a full allowance in the height of work.—But the farmers say, they allow eight bushels to six horses, and it scarcely does.—Chaff is accounted fouler feed than oats, and so not so good for saddle-horses as for cart-horses.—Now, supposing oats at 20s. per quarter, the above allowance comes but to 6 l. 10s. per annum for oats.—Note, the farmers say, barley-chaff is too hot and binding for horses not used to it, and oat-chaff is little worth.

Farmer Lavington and Thomas Miles of Wiltshire say, that wheat and barley-chaff mingled together are best for horses.

Coming into my stable (and suspecting I had not the best chaff for my money, for I bought my chaff that year of the farmer) I found, as I thought, too much oat-chaff with the barley-chaff, and was angry :

but

but my carter answered me, there was not oat-chaff enough; if there were more, he said, the horses would eat it better: one part oat-chaff and two parts barley-chaff was the best proportion; for the barley-chaff, though the more heartning, yet was rough in the mouth, and very troublesome and unpleasant on that account, but the oat-chaff softened it: especially after watering, barley-chaff alone was very improper, but before the water washed it down.—Then, said I, wheat-chaff mixt with the barley-chaff seems to me to be best, because that is soft, and answers all the ends of oat-chaff, and is more heartning.—This he agreed to.

§. 25. Conformable to the opinion of the antients, ^{The smaller the chaff the more nourishing.} viz. that those sorts of chaff were most nourishing which were smallest, as has been before hinted, is our practice amongst the farmers: for, when fodder-straw is dear, we cut it, finding it thereby to be most nourishing; it seeming, that of the smaller parts any thing consists, it the more enables the juices of the stomach to digest it, and the juices of that thing are the easier extracted from it: thus we grind corn for poultry, hogs, &c. whereby we suppose it more nourishing than whole corn,

§. 26. I thought my barley-hulls this year (anno ^{Of barley-chaff.} 1718) would be very good, because my barley had taken no rain in harvest, and, the summer having been very hot and dry, they were the pure oils of the barley, without any mixture of leaves of weeds, &c. with them.—But my thresher told me, that my hulls, for that reason, were never worse; for they were so rough and coarse, and so harsh to the horses mouths and throats, that my carters complained of them, and said, their horses care not to eat my barley-hulls as usual: whereas, said he, in wet years, when the broad and hop-clover grow to a height in the corn, as also other weeds, their leaves soften the asperity of the barley-hulls.

I threshed

I threshed hop-clover for seed (anno 1701) and saved the leaves, which we beat out, and gave to the horses, and they liked them much better than chaff.

To save
barley-
straw and
peas-halm
for litter.

§. 27. It is good to save barley-straw and peas-halm, in the spring after threshing is over, for litter for horses throughout the summer; to save wheat-straw, for which there is always in the hill-country, where there are many barns, and wheat-reeks, and less wheat sowed than in the vale, a greater occasion than for barley-straw, for thatching.

ASSES and MULES.

§. 1. **W**ITHIN five days of a she-ass's foaling, she should be horsed again: a she-ass was horsed two seasons with a jack of her own foaling, and she went through both times.

Asses of
great price
in Spain.

§. 2. I asked Mr. Garret, if he had not seen a jack-ass sell for 30 l. — he assured me, he had seen two in the king of Spain's stables at Madrid, which cost him 60 l. each; they were fourteen hands high, but were strange rough, dull looking creatures, especially about the head; the king had them to get mules.

Of mules.

§. 3. He said, there was one thing very remarkable, when a mare takes a stone-ass, and has a mule-foal by him, such a mare will ever after go through, if leaped by a stone-horse, and will never bring a horse-foal after.

The mule begot between an he-ass and a mare is commonly livelier, and more like the nature of the mare, than a mule begot between a stone-horse and a she-ass. *Partus sequitur ventrem*, says Mr. Mortimer.

Of sitting
asses noses.

§. 4. In the island of Malta, Ray first noted the custom of sitting up the nostrils of asses, because they being naturally streight and small, are not sufficient to admit air enough to serve them, when they travel

travel or labour hard in the hot countries: and thence he philosophically reasons, that the hotter the country is, the more air is necessary for respiration.

W O O D.

§. 1. **I**F your acorns, mast, and other seed be to be sowed in a place too cold for an autumnal semination, your seeds may be prepared for the vernal semination, by being barrelled or potted up in moist sand or earth, stratum super stratum, during the winter, at the expiration whereof you will find them sprouted, and they will be apter to take then than if they had been sown in the winter, and will not be so much concerned at the heat of the season, as those which are crude and unfermented would, when newly sown in the spring, especially in hot and loose grounds. Evelyn's Sylva, fo. 7. Of acorns, mast, &c.

§. 2. I know it is a tradition, that the elm and fallow have no seeds: but I have raised several of them from seeds. Cook, fo. 5. Of the elm and fallow.

§. 3. Mr. Raymond put me very much upon sowing ash-keys up and down in my woods; and setting plants in all vacancies. — I have known great improvements made in coppices by sowing ash-keys. Of ash-keys.

§. 4. The withy, fallow, ozier, and willow, may be raised from seeds, but, as they seldom come to be ripe in England, the other ways of raising them are more practicable. Mortimer, fo. 364. and withy, &c.

§. 5. The ash is one of the worst trees to take root by laying: but yet it will take. Cook, c. 1. fo. 1. Of laying ash, oak, and elm.
— The oak will grow of laying, and so will the elm very frequently. ib. Cook.

Those sorts of trees which will grow by cuttings, are the easiest to raise by layings. Cook, fo. 9.

§. 6. Touching the best way for laying your layers of trees, observe, if they be trees that hold their Of laying trees.

their leaf all winter, as firs, pines, holly, yews, box, bayes, laurel, ilix, &c. let them be laid about the latter end of August. *ib.* Cook.

But if they be such as shed their leaves in winter, as oak, elm, lime, sycamore, apple-trees, pear-trees, mulberry, &c. let such be laid about the middle of October. See the reasons, Cook, *ib.*

I know in small plants the spring or summer doth very well for laying them, for they, being short-lived, are the quicker in drawing roots. *ib.* fo. 10. The same rule holds for cuttings, as to the season. *ib.* fo. 12.

In laying, if you will, you may twist the end you lay in the ground like a with. *ib.* — As to laying, the harder the wood is, then the young wood will take best, laid in the ground, but, if a soft wood, then elder bows will take root best. Cook, fo. 11.

I think Mr. Ray says, that the elder stick will put forth roots, if it be set in the ground, at any place between the knots, though there be no joint: however, if Mr. Ray has not said it, I am sure it is true.

Of raising
trees by
the roots.

§. 7. In raising trees by the roots of a tree, let the tree be a thriving tree, neither too young nor too old; for, if it be too young, then the roots will be too small for this purpose, if too old, it is possible the roots may be decaying, and then not fit for this purpose. Cook, fo. 13, and 14.

Of raising
suckers.

§. 8. You may raise suckers from such trees as may be propagated by suckers, by digging about the roots early in the spring, and finding such as with a little cutting may be bent upwards; raise them above ground three or four inches, and in a short time they will send forth suckers fit for transplantation: or you may split some of the roots with wedges, or break them, covering them with fresh mold; they will quickly sprout out. Mortimer, fo. 323.

§. 9. Monsieur

§. 9. Monsieur Quinteny, part 2d. fo. 180. saith, I affect to plant presently after Martinmas, in dry and light grounds, but care not to plant till the end of February in cold and moist places, because the trees in this last can do nothing all the winter, but may more likely be spoiled than be able to preserve themselves; whereas in light grounds they may begin even that very same autumn to shoot out some small roots, which will be a great advance to them, and put them in the way of doing wonders in the following spring. — I recite my author, because I think it applicable to planting quick-set hedges; having in the year 1702 planted quick-set hedges in November, in very good, but strong cold clay-land, and the winter proved wet, whereby such land must be so much the colder; but the summer proved a very dry hot summer, which one might have thought more beneficial to such earth, but (according to Monsieur Quinteny's observation) the ground being chilled, the plants came not away all the summer following, making very poor shoots, and but just saved themselves from dying; and I believe their condition was so much the worse, because I ploughed up the trench wherein the sets were planted, before it was dug, whereby the earth laid some time a sodding: on the other hand, I planted a mead of cold clay-land the latter end of February, but the land was very good; and the plants made extraordinary shoots.

Legendre, the Frenchman, says, in such soils as are moist and backward, it is best to stay till the end of February before you plant; because too much moisture corrupts and rots during winter, but the hot and early grounds must be planted in November, that the roots beginning before winter, whilst the warm weather lasts, to put forth some small filaments, may so unite themselves with the earth, that

the trees at spring may grow and flourish so much the faster, fo. 19.—Trees are not fit to be replanted, till their sap be wholly spent, for if there be any sap in them, when they are taken up, having now no more nourishment, they fade, and their bark which is yet tender, will grow rivelled and dry, and so it is the less capable of receiving the new sap when it begins to ascend in the spring, fo. 93.—We see that, if trees grow yellow, and sick, having but a small store of sap, they presently cast their leaves, ib.—Now seeing the sap falls sooner in dry grounds than in those which are moist, it is certain that in such grounds trees may be both taken up, and also replanted earlier, ib.—The small branches and buds of a tree new planted must be taken off, which open a passage in the bark, and come out of the body of the tree, for they always grow up with the greatest vigour, fo. 96.—In pruning, and stopping the growth of the boughs, care must be taken to cut one short one between two long ones, that being unequal when they come to spring, the middle of the tree may be the better furnished. In the same manner must the dwarf-standards be cut, because that each branch, which is cut, puts forth many more, and therefore being cut all of the same height, they cause confusion of branches in the top of the tree, and the midst of it in the mean while remains unfurnished, because the sap designs always to ascend, and runs more willingly into the high boughs than into those that are lower, fo. 124.

Lord Pembroke tells me, it was a common saying, that all trees were to be planted when their leaves were falling: and he looked upon it to be a good rule for such trees as were naturally of the growth of the same country where they were transplanted, or of a cold country, as the northern fir, which naturally grows in the north; if any of them are transplanted

planted hither, or raised from seeds, they may be transplanted at the first fall of the leaf before winter : but it is otherwise with the southern fir, for you must stay till the warmth of the spring for the transplanting of that ; and this distinction, said he, it was reasonable to think held good in all cases between northern and southern plants.

I observe fir and holly-leaves do not fall so often on our cold hills, as in the vale, nor do the spruce-fir in particular litter our walks so much as in warmer places : the reason why these ever-greens keep their leaves some years, is from the viscosity of their juice, which is more so in our cold country, but in a warmer soil or clime is so attenuated, that the leaves must fall oftener.

Langford of planting says, that when the seed-^{The manner.}lings are grown up to a foot high fit to be removed into the nursery for inoculating, &c.—the tap or heart-root ought to be cut off, that it may not run directly downward beyond the good soil, but may spread it's roots abroad in breadth.

Strong and well-grown trees may prosper as well or better than small ones, especially in uncultivated or stiff land by nature, where young trees cannot so well put forth roots. And if you should have a tree between ten and thirty years old that you have a mind to remove, you must about November, the year before you transplant it, dig a trench as narrow as you please, but so deep as to meet with most of the spreading roots, at such a distance round about the body of the tree as you would cut the roots off at when you remove it ; about half a yard distance from the body of the tree may do very well, except the tree be very large, but, if you have not far to carry it, leave the roots the longer ; as you make the trench, cut the roots you meet with clear off, and smooth without splitting them, or bruising the bark ; then fill up the trench again, and by the next

October, when you take up the tree, you will find those great roots will have put forth many fibrous roots, and made preparation for more, which fresh and tender roots upon removal will enable the tree to draw more nourishment than otherwise it would be able to do. Langford, fol. 18.

Of cutting
off the tap-
root.

§. 10. Before I had read Quinteny, and found by him, how necessary it was to spread the uppermost range of roots flat down, so as to run between two earths, I knew not the reason for cutting off the tap-root; but now it is plain the uppermost range of roots could not be so spread unless the tap-root were cut off. — There is also a farther reason for cutting off the tap-root, because being a stronger root than the rest, it draws the nourishment from them, and shooting downwards, after some time dies in the poor clay, and the other spreading roots being cramped and stunted at first, never after make good roots, or recover it.

Rules for
planting.

§. 11. * Columella advises, to set trees removed towards the same aspect they grew in before. lib. 5. fol. 150.

In transplanting omit not your placing trees towards their accustomed aspect, ib. and, if you have leisure, make the holes the autumn before. — Plant deeper in light, than in strong ground, and shallowest in the clay: five inches is sufficient for the driest, and two for the moist land, provided you establish your plants against the wind. Evelyn, fol. 224.

† On a rocky, chalky, or gravelly soil, if you can-

* Mr. Miller concludes this rule to be of no consequence, from several trials he has made.

† Mr. Miller advises, if the trees have been long out of the ground, so that their fibres are dried, to place their roots in water eight or ten hours before they are planted; observing to place them in such manner, that their heads may remain erect, and their roots only immersed therein; which will swell the dried vessels of their roots, and prepare them to imbibe nourishment from the earth.

not conveniently raise a hillock, and plant on the surface, dig the holes shelving inward, that the roots may find their way upwards, and run between the turf and the rock.

Plant forth in warm and moist seasons, the air serene, the wind westward ; but never while it actually freezes or rains, nor in misty weather, for it moulds and infects the root. Evelyn.

* I was discoursing with Lord Pembroke on his plantation of elms at Wilton, which were of the largest magnitude any had been known to be planted : he said, of those, the heads of which he had lopped when he had planted them, not one in twenty lived, but those he had planted with their heads unlopped, not one in twenty died.

Trees produced from seeds must have the tap-roots abated, the walnut-tree, and some others excepted ; and yet if planted merely for the fruit, some affirm it may be adventured on with good success : you must spare the fibrous parts of the root, those who cleanse them too much are punished for their mistake. Evelyn, fol. 224.

§. 12. If you are to plant a coppice, it is a good way to set your plants in trenches. as one raises quick-set hedges, and not to sow seeds, for they are

Of plant-
ing a cop-
pice.

* Mr. Miller greatly disapproves the modern practice of removing large trees. If planters, says he, instead of removing these trees, would begin by making a nursery, and raising their trees from seeds, they would set out in a right method, and save a great expence, and much time ; and they would have the constant pleasure of seeing their trees annually advance in their growth, instead of their growing worse, as will always be the case where old trees are removed.—For of all the plantations which I have yet seen, let the trees be of any sort, there is not one which has ever succeeded.—New-planted trees, says he, should be watered with great moderation, and he proves, from an experiment made by the reverend Dr Hales, that it is impossible such trees can thrive, where the moisture is too great about their roots.

tedious in coming forward, and will tire one's patience in weeding them.—I would not set above four plants in twelve feet square, and at regular distances, so that the benefit of ploughing might not be lost, and then at six or seven years growth I would plash, by laying the whole shoot end and all under the earth in the trenches, which would not therefore be choaked, but shoot forth innumerable issues: this, by great experience, oak, ash, hazle, and withy, will do.

In our parts we never set less than an hundred plants in a double chafed lugg; and, if the earth turned up such rubbish and stony stuff that the edge of earth on which they are to plant, is too narrow for a double chafe, then they always set eighty plants on a single chafe in a lugg.

Of young
ashes taken
from
woods.

§. 13. Young ashes taken out of the wood to be planted, will neither be well rooted nor taper, but top-heavy; therefore you will be obliged to take off the heads before you replant them; and then at best, expect but a good pollard, and it is possible you may wait long before you can get it to thrive; for the head being taken off leaves such a wound as will be long in curing, and yet you were obliged to do it, or else the roots could not have maintained that head: it is the same with a walnut, therefore be sparing of taking off the topmost of them. Cook, fol. 2.

Id. and of
walnuts.

If you move a little ash-shoot of about one foot in stature, you must not by any means take off it's top, which being young, is pithy, nor by any means cut the fibrous parts of the roots, only that downright or tap-root is totally to be abated: this work ought to be done in the latter end of October or the beginning of November, and not in the spring, Evelyn's Sylva, fol. 41. The side branches of such a shoot may be cut off, ib. Being once well fixed, you may cut it close to the ground, as you please, it will
cause

cause it to shoot prodigiously, *ib.*—Never let your walnut-tree, when transplanted, be above four years old, and then by no means touch the head with your knife, nor cut away so much as the tap-root, if you can conveniently dispose of it, since being of a pithy and hollow substance, the least dimunition or bruise will greatly danger the killing it. *Ev. ib.*

Walnut, ash, and pithy trees are safer pruned in summer than in winter, in the warm weather than in spring, whatever the vulgar may fancy. ^d *Ev. fol. 223.*

§. 14. The feedingest ground makes the toughest ^{of timber.} timber, for where an oak grows most in a year, that oak will make the toughest timber; but in dry grounds oaks grow slow, and the annual circles being close together, the timber must then be the finer grained. *Cook, fol. 37.*

The inside rings, says Evelyn, are more large ^{Growth of} and gross, and distinct in trees, which grow to a ^{timber.} great bulk in a short time, as fir, ash, &c. smaller or less distinct in those that either not at all, or in a longer time grow great, as quince, holly, box, lignum vitæ, ebony; so that by the largeness and smallness of the rings the quickness or slowness of the growth of any tree may perhaps at certainty be estimated. These spaces are manifestly broader on the one side than on the other, especially the more outer, to a double proportion or more, the inner being near to an equality. It is asserted, that the larger parts of these rings are on the south and sunny side of the tree, which is very rational and probable; and this seems to be the reason for setting a

^d Mr. Miller advises by no means to cut off the main leading shoots when you transplant, for, by several experiments he has made, he has found, that the shortening of the branches is a great injury to all new-planted trees. — See his Dictionary—article—Planting.

tree, you remove, in the same position, because of maintaining the same parts in as good a manner as before. Wafer, in his book of the isthmus of Darien, says, the Indians know not, when the sun is obscured by clouds, how the points of the heavens lie, but by cutting round the bark of a tree, and on that side the bark is thickest they know to be south. — It must be much more so in our northern climates than under or near the tropic.

Of the circulation of sap.

§. 15. There is dispute among the learned inquirers whether there is a uniform circulation of sap in plants, or not. * The author of the Burgundian philosophy assures us, that, if some of the roots of a plant be put into water, and other roots of the same plant be kept out of water, yet these latter will increase, and shoot forth fibres as well as the former; again, if a plant, that has two branches, be taken up by the roots, and the extreme part of one of these branches be put in water, this whole plant shall remain a long time without any decay, and even sometimes put forth leaves on the other branch, when another plant of the same kind, taken up in the same manner, and none of the roots or branches put in water, shall soon wither and die. From these two experiments he infers, there is a reciprocal circulation of sap from the trunk to the roots. — We are told by Ray, fol. 18. (Malpigijs and others concurring) that one of the main uses of the leaves in trees and plants is to prepare and concoct the nourishment of the fruit,

* Si ejusdem plantæ quædam radices aquâ sunt immerfæ, reliquæ extra aquam extarent, eæ tamen, ut radices intra aquam demerfæ, increfcere vifæ funt, & novas fibras emittere; quod demonstrat quod reciproca circulatio est à truncò in radices. Phil. Burgund fol. 1149. Eadem est ratio plantæ à terra cum radicibus avulfæ, & in duos ramos divifæ; nam si unius rami extremum aquâ immerfum fuerit, planta diu integra & viridis permanet, & interdum folia in racemo altero germinat, cum alia planta ejusdem generis tunc avulfa statim marcefcatur.

and

and the whole plant, not only that which ascends from the root, but what they take in from without, from the dew, moist air, and rain. As a proof of this, it is asserted, that if many sorts of trees be despoiled of their leaves, they will die, as it happens in mulberry trees, when the leaves are plucked off to feed silk-worms; and if in the summer season you denude a vine branch of it's leaves, the grapes will never come to maturity, because the juice returns from the leaves that served to nourish the fruit: hence also they infer a circulation of the juice in plants. — That there is a regress of the juice in plants from above downwards, and that this descendant juice is what principally nourishes both fruit and plant, is well proved from the experiments Mr. Brotherton has made. *Phil. Transact.* No. 187.

Mr. Bobart assures me, that in a nursery, he has bent the top of a young grafted plum-tree to a plum stock, and grafted it; and that, when the graft took, he cut off the young tree from the root; which tree notwithstanding flourished, and bore fruit by the retrograde sap, which shews the sap descends as well as ascends.^f

§. 16. My woodward assures me, that windy weather makes the sap rise much sooner in trees than ^{Wind makes the sap rise.}

^f In opposition to the notion of the circulation of the sap in trees, says Mr. Miller, the reverend Dr. Hales has presented us with many experiments, and thinks upon the whole, from these experiments and observations, we have sufficient ground to believe, that there is no circulation of the sap in vegetables; notwithstanding many ingenious persons have been induced to think there was, from several curious observations and experiments, which evidently prove, that the sap does, in some measure, recede from the top toward the lower parts of the plant; whence they were, with good probability of reason, induced to think, that the sap circulated. — Vid. these experiments in Miller's Dictionary, article, Sap, or in Dr. Hales's Treatise on vegetable statics.

it

it otherwise would do, though not attended with rain, especially if the wind be southerly or westerly.

A branch
that blights
one year
apt to
blight the
next, and
why.

§. 17. It is very generally to be observed, that where a whole tree, or arm of a tree, is much blighted one year, it is very apt in such case, to blight again in following years, especially if the season of the year shall not be kindly : for which this reason may be given ; there are particular roots which for the most part feed particular branches, though there may be also a considerable nutriment from the general circulation of sap ; now, if any such root fails, as by many causes it may, no wonder if the branch so depending on it should yearly blight, and yet it may at spring put forth leaves, &c. by reason of the great redundancy of sap, by participating of the supposed circulation ; but when the sap grows less vigorous, then the failure will appear. Again, in all blights you must suppose a shrinking, and contraction of the fibres, and vessels of the branch that blights : no wonder then, if on such withering, contraction, and closure they never receive the sap so kindly as before, especially after the run of the spring-sap is over, which may for a time produce leaves and blossoms, but will by Midsummer, when that plenty abates, be deserted.

Not to put
cattle into
woods to
eat up the
fedy
grais.

§. 18. I observe the fedy gras comes not up in felled coppices the first summer ; consequently the young shoots have a year's start of that gras ; the next summer the fedy gras comes up, and grows ankle-high, equal with the two-years shoots ; but what harm can it then do to the wood ? The third year the fedy gras dies, and you see no more of it. I speak this, in answer to the country-man's objection, who pleads for putting some sort of cattle into coppices to keep down the sedge, which he pretends otherwise will choak and damage the plants. — I have experienced this to my cost.

§. 19. It

§. 19. It was May the 6th (anno 1701) that I ^{Oak-buds} bought some yearlings; and I asked the farmer, if ^{poison to} I might not put them in the coppice till Midsummer; the farmer said, not yet, by any means; for fear they should be oakered, that is, lest they should bite off the oak-bud before it came into leaf, which might bake in their maws and kill them, but after the oak-bud was in leaf it would be safe enough.—The higher coppices are fit for yearlings, and the coppices of the last year's growth for hog-sheep in winter.—My shepherd said, what the farmer observed as to the oak-bud was true; but he thought that the year was so backward that they were not yet come out, and so there could be no danger at present.—Farmer Elton said, his father had lost abundance of yearlings by the oak-bud, by putting them into the coppices while that was out.—I have since experienced the same, and have remarked it, when I treated of black cattle. See Grazing, §. 17.

§. 20. It is a common saying, that calves will ^{Of calves} not crop in woods: but I put six calves into my ^{cropping} woods, in November, which very much cropped the yearling-shoots. All husbandmen I told of it very much wondered at it; but the reason to me was clear, viz. on first putting them in there came three or four days hard frost, with a shallow snow, and a rime that laid on the bennetty grass, so that they could not come at the ground, but only meet with brier-leaves, of which, though I had plenty, they were but thin diet to depend on altogether, yet together with other pickings would have been a noble maintenance for them, if they could have come at the rowet: this streightness of commons brought them to the necessity of cropping the young shoots, which they afterwards continued to do, having got the habit of it, and finding, when the open weather came,

came, the shoots to be toothsome, though the row-et in the coppices would have been sufficient.

For a general rule, newly weaned calves are less hurtful to newly cut spring-woods than any other cattle, especially if there be abundance of grass; and some say, colts of a year will do no harm; but the calves must be permitted to stay awhile longer, and surely the later you admit beasts to graze the better. Evelyn, fol. 147.

Of wood
hurt by
cattle.

§, 21. I was at my coppice where my labourers were felling, and observed to them with some wonder, that, though the coppice then felling was of my own preserving, ever since it was last felled, yet the growth seemed not more than it was, when in the farmer's hands, who abused it with cattle, nor did I sell it for more than when I last felled it. — The reason they judged, was, because the biting it in the farmer's time had brought it to a small stem, and, said they, wood of a small stem or stock will not bring a large shoot: for it requires two or three fellings to pass, though preserved, before wood abused can recover to a stem, so as to send forth a good strong shoot. — Note, from hence arises a corollary, as a farther inducement to let coppice-wood grow to fourteen years growth, if the land will so long maintain it, because the circle of the annual growth is not only thereby much increased, but also from a larger stock or trunk stronger shoots will put forth, and carry a proportionable annual increase to the fourteen years end.

I carried two experienced woodmen into my woods, they having bought some lops of me, and shewing them the damage the farmer had done me, they observed it, and said, it was much to be lamented; because those shoots, which were cropped, would grow forked, and never be fit for rods. — I asked my woodman what price my rods yielded; he said,

said, the last year 12d. per hundred, but this year, 1699, wood being dearer, 14d. per hundred, and, in case they were not bit by cattle, they would fetch 15d. or 16d. per hundred. — The above two men advised me to cut this coppice at seven or eight years growth; for, said they, the roots are so much damaged by the feeding of cattle, that they will be apt to die away, and not maintain their burden to ten years growth.

I was seeing my woodman make his fold-hurdles, he was very uneasy about the splitting them and working them; he shewed me two or three knots in most of the rods where they had been bit in the growing by the cattle; where the rods had been so browsed that they would hardly split through those knots, at least not by an equal division without snapping off, and many of them did snap off, and such split rods, if they would split, and the whole rods, when they come to work and wind, would in twisting often break at those knots. — From all which I do conclude, that it is of a very ill consequence to put cattle into coppices, for which the treading down the briers and sedge is but a small equivalent. — And if hog-sheep are put in, and at seasonable times, it is endless watching them; for when they begin to fall on the wood, they will all fall on together, and bite every stem in two days time. — And it may be concluded from that brittle knottiness, which the working those rods discover, how ill the sap can pass upwards, to feed the top-shoots, through the whole compass of years they have to grow, to the growth of which the obstruction the sedge gives for one year can be but little: admitting which, I would then advise the shepherd, at a proper time, to go with his whole flock, and tread down, and eat up such rowet in one day's time, taking such a time or times for it as may be most seasonable,

able, as suppose frosty weather, the rowet being then the sweetest.

The 17th of January (anno 1702) I ordered my hog-sheep to be turned into the coppice, intending they should eat up the rowet for some time. — My shepherd immediately drove them thither, but, as he observed, the sheep instead of eating the rowet, fell on the young shoots, and eat them with that greediness, that he called the labourer who was felling in a neighbouring coppice, to observe it also : and he told me of it afterwards, and said, he stood by and saw them bite off shoots at half a foot in length. The reason of this, said he, must be from their sweet feed on your clover, for which cause they will not, like other sheep, touch your sour rowet.

The reason why shoots bit off by the cattle perish farther downwards than the same branch would do, if cut with a knife, is, because the top of the shoot being bit, is rugged, whereby the water runs not off, but keeps soaking down ; whereas, had it been cut with a tool, it's smooth and sloped edge, like a hind's foot, would cast the water off.

It is generally said, that sheep going in woods, and rubbing against the trees, or the young shoots, do by their wool poison the very bark, so that it shall in that place canker, or at least the tree in that place shall visibly grow hide-bound, and bend in, and grow gouty above such rubbing place. — This I suppose must arise from the abundance of oil in the wool, which, the sun and wind drying it in, enters the bark, and choaks up the pores, where the passage of the sap is : in the same manner ointments laid on swellings are repellers, inasmuch as they stop the pores of perspiration ; and linseed-oil laid on bricks keeps out weather.

Damage
from hogs
in woods.

§. 22. Farmer Ratty told me, he had once heard say, that hogs would do as much harm in a young coppice

coppice as any other cattle ; but he did not believe it, till fetching away some wool he had bought of me in July (anno 1701) he found a farmer's pigs broke into my coppices, and he observed them to fall on the shoots, and eat them up as fast as other cattle. * I wonder the antients, who preferred wood to pasture, should not consider the damage that cattle did them.

§. 23. My woodward assures me, that if I would let my coppices run to fourteen years growth, instead of ten, which I might do by dividing them accordingly, they would yield a fourth part more profit, because a coppice at fourteen years growth will yield double the value of a coppice at ten, the increase of wood when it comes to be eight or nine years old does so much advance.—But here it is to be noted, that there are some parts of my coppices which grow on very barren land, that is out of proof, and the wood will be scrubbed and grow rotten, and dead on the tops before it is ten years old ; it cannot be profitable to let such wood grow to fourteen years of age.—He also assures me, that my hazle at fourteen years age, which runs up without knots, is as fit for hurdles, being split, as any other.

Of letting
coppices
grow to
fourteen
years.

I was speaking to my labourers of the advantages of letting my coppice-woods run to fourteen or fifteen years growth, where the land was in condition good enough to support the wood to that growth. They added to what I had said, that, by letting the coppices stand so long, the wood would be run to so large a stature as to over-shadow the grass, whereby the roots of the sedge-grass, which so much over-run the young coppices, to the prejudice of the young wood, would thereby in a great measure be killed.

Letting coppice-wood grow to sixteen or seven-

* *Pascuntur armenta commodissime in nemoribus, ubi virgulta & frons multa.* Varro, fol. 56,

teen years growth is of great service to young heirs; because by so many years growth their barks are case-hardened, and able to withstand the cold, when the coppice is cut, and they must stand naked, whereas, when coppices are cut at ten and eleven years growth, the barks of the young heirs are so tender, that they are starved with the cold air and winds. Ivy itself, says Evelyn, (the destruction of many a fair tree) if very old, and taken off, does frequently kill the trees by a too sudden exposure to the unaccustomed cold.

When coppice-wood is of fourteen or fifteen years growth, it will fetch a better price in proportion than younger wood, because it will be applicable to more uses, and particularly in the cooper's business; for he will use the withy and some of the ash for hoops and wine-hogsheads; another part of the ash may serve for prong-staves, rake-staves, and rath-pins for waggons, and the rest may be parcelled out for hurdle and flake-rods.

Oaken stems of fourteen years growth are (in my woods, which in a great measure consist of them) as high as the ash or withy, and measure more in the diameter; for oaken stems are stronger at root, and will hold growing longer than ash, withy, or hazle. When hazle grows spriggy in the body, and shoots forth from the sides of the bark, it is a sign that it has given out, and done growing at the top.

Of the
time of
cutting
coppices.

§. 24. Coppice-wood, in hedging and hurdling, wears much better and longer, if cut between Michaelmas and Christmas, but sells best in faggots, if cut between Christmas and Lady-day, because it shrinks less, and is most swelled, and looks best to the buyer; the method at Crux-Easton, and the hill-country thereabouts, is only to oblige the buyers to rid the coppice by Midsummer; they think the coppices are not harmed, if rid by the time the
the

the Midsummer-shoots spring up : they had not rid this year (anno 1697) by the latter end of July.

It was the first of May (anno 1701) and I proposed to cut coppice-wood for the fire : my woodward said, it would not hurt the stools to cut it so late, but it never would wear well in hedging, nor burn well ; for, after the blaze was out, the coals would burn as dead as if water had been flung on them.

I had a doubt how I should fence-in my corn and hay-reek I was going to make, August the 27th, (anno 1701) having no wood cut fit for the purpose, and supposing it too early then to cut for it. — But my woodward assured me, it was very safe to cut coppice-wood at Bartholomew-tide, and it did the mores no damage ; and, said he, all the farmers in the country, in the last year of their lease make a felling between Bartholomew-tide and Michaelmas, of all the underwood their lease will justify them in.

It is observed, that coppice-wood, cut for hedging at the latter end of winter, will not endure so long by a year as that which is cut at the beginning of winter : which, as I believe, may not only be, because the wood late cut, is cut after the sap is risen, or attenuated by the sun, but also oftentimes because it is not cut long enough before such rarefaction is made ; for, if a tree, or a cyon cut to be grafted, as Quinteny affirms, will endure many weeks of the winter out of the ground, or without being grafted, and, when spring shall come, it will by vertue of the sap inherent in it, when attenuated, put forth buds for some time, till it dries away ; so it follows, that the sap inherent always in the stem of the wood, if not cut so early as to have long time to dry, may be put into motion at spring, so as to effect the above-mentioned inconvenience ; therefore I hold hedging-wood and fire-faggots should be cut in October.

My woodward says, he thinks it is best for coppice-woods to be felled the latter part of the year, about February or March; for, says he, if they be felled early in the winter, the frosts fall on their stools, and dries, parches, and shrinks them at the top, and obliges the bud at spring to shoot forth three or four inches lower than else it would do; whereas, if they be cut late, the bud will break forth at the top. — A short time after, I asked Harding of Holt the wood-merchant about it, and he agreed to the same.

It is a common practice of husbandmen to fell their hedge-rows, and small brakes within the grounds, those years they sow the grounds with wheat; but such persons ought well to consider, first, whether such land, after the wheat is off, will not bear a rowet too long for sheep to eat, and, if so, great cattle must be put in to eat up the long rowet, and the sooner the better for their tooth, and then attendance must be given by a cow-keeper by day, before the harvest is in, and consequently the wages the dearer, and when you may have many other offices to employ such a person in: therefore, in such case, my advice is to let the hedge-rows stand till after the wheat-crop be got in, when great cattle may be suffered to feed down the rowet without prejudice to the hedge-rows, and at that time of the year such grass is wanted by night, and, during the future three crops, it is to be supposed the rowet will not be so large, but sheep may overcome it, nor will they very much prejudice the young wood.

Of the manner of cutting coppices. Of pollarding oak, elm, and beech.

§. 23. In your coppices, says Evelyn, cut not above half a foot from the ground; nay the closer the better, but slope-wise to the south, fo. 149.

§. 26. The oak will suffer itself to be made a pollard, that is, to have it's head quite cut off; but the elm so treated will perish to the foot, and certainly

tainly become hollow at last, if it escape with life.
Evelyn, fo. 151.

The beech is very tender of losing it's head. Ev.
fo. 151.

§. 27. ^a The bark in the hill-country will not strip ^{Of strip-}
so soon by a month as in the vale : again, in the ^{ping off}
same wood on the hill, there will be a fortnight or ^{the bark;}
longer difference between the stripping of a tree, that
is in proof, and one that is not : the sap runs fastest
up a tree in proof.

After stripping, when the bark is dry, it is high
time to rid the wood of it, for, if a quantity of rain
should come it would do it much hurt, and take off
it's strength, and then it would grow * finnowy : * Mouldy;
therefore the tanners, when they buy bark, hurry
it away with all the carriages they can get, as they
would to save corn from damage.

The sap after open winters never runs well in
barking-time at spring ; for it spends itself gradually
before-hand, and forwards some part of the branches
of a tree when other parts stir not, and so all the
branches will not bark equally alike : again, a hard
frost at the entrance of the spring, as this year (anno
1708) so as to check the rising sap, and disturb it
while it is rising and spending itself, is a great
hinderance to the kindly barking for that season;
and makes the sap do it's business by halves ; but a

^a Mr. Miller observes, that the time for felling timber is from
November to February, at which time the sap in the trees is
hardened ; for when the sap is flowing in the trees, if they are
cut down, the worm will take the timber, and cause it to decay
very soon, rendering it unfit for building either ships or houses.
He thinks therefore it would be more for the publick benefit, if
(instead of the statute now in force for felling trees during the
spring season, when the bark will easily strip) a law were enact-
ed to oblige every person to strip off the bark of such trees, as
were designed to be cut down in the spring, leaving the trees with
their branches standing till the following winter ; which will be
found to answer both purposes well.

frost some time before the spring does a kindness : in short, the greater the flush of sap (coming all at once) it makes the better bark, and is better both for the tanner and the stripper.

As I have observed before, the sap in oaks rises slower at spring, and the bark strips worse, and the tree that year makes worse shoots, when in a lingering manner lucid days too early in the spring have often invited forth the sap from the roots, which has as often received sudden checks by the cold, than when the beginning of the spring of the year continues cold, whereby the sap in the roots continues filling and is kept from spending itself in the trunk and branches, till the uninterrupted heat breaks forth, and the flush of the sap ascends with continual solicitations by the heat : in like manner it is, I suppose, with less and tender plants ; their shoots are stronger, the grassy part more tender and gross, when the backward spring carries afterwards an uninterrupted heat, than when the buds and shoots are earlier invited forth, and then stopped by the cold. We find all garden-herbs in like manner, which have slowly kept growing on all the winter, not so toothsome to the insects as those, the seeds whereof are not committed to the ground till spring.

Of trees
living
when
barked.

§. 28. Between the annual circles doth some sap arise, as is plain in a tree barked round, which yet will live ; and the more porous this tree is between these annual circles, the longer that tree will live ; as I have experienced in walnut, and ash, but holly and box died in less than a year ; for trees that hold their leaves, their wood is close and compact between the annual circles, and that is the reason they die soon after being barked round. Cook, fo. 48.

Time of
faggot-
ing.

§. 29. I asked my woodward the 13th of March (anno : 702) if it was not time to faggot ; he replied, the wood-chapmen did not care to have their wood faggotted

faggotted so early, till it had shrunk, else, after it was faggotted, it would be apt to shrink and fall to pieces : therefore, said he, we faggot that wood first which was first cut.

§. 30. In loading wood one man on the cart can Of pitch-
flow to two men that pitch it up : therefore, where ^{ing and}
you cart wood by change of waggons, you do not ^{flowing}
find your horses full employ, where but one man ^{wood on}
the cart.
pitches.

§. 31. I cut down green timber in August (anno ^{Of drying}
1707) to set my lath-maker to work to make laths ^{laths before}
for immediate use : he desired me to let him set them ^{using.}
out sunning for four or five days before he bundled
them up, or that I used them, that they might be
dry ; for, said he, the timber being green the nails
will rust, and so rot, and then break off, unless the
laths were first dried.—And so said the carpenter.

§. 32. Oak-underwood and white-thorn are the ^{Of grub-}
worst of any to grub ; because they both shoot their ^{bing.}
roots more downwards than any other.

It was the beginning of March (anno 1701) I
agreed with two labourers to grub a hedge-row :
they desired they might go upon it presently, before
the sap was got plentifully into the roots ; for such
roots, if they were full of sap, as well as their
branches, would, they assured me, if cut then,
though never so dry afterwards, burn dead, and
make but a sorry fire.

F E N C E S.

§. 1. **M**A P L E, if it grows in hedges, will ^{Maple had}
destroy the wood under it ; for it re- ^{for hedges.}
ceives a clammy honey-dew on it's leaves, and,
when it is washed off by rain, and falls upon the buds
of those trees under it, it's clamminess keeps those
buds from opening, and so by degrees kills all the
wood under it. Cook, p. 72.

Advice to
sow haws.

§. 2. I would advise the country-gentleman to sow many haws, &c in his nursery, that, where they grow thin in his hedges, and there are vacancies, he may dig up those plants, earth and all, and carry them to fill up such empty spaces. It will be good however to sow those haws in poor ground, for, if transplanted from a rich soil to a poor one, they will not thrive well.

Of cutting
black-
thorn.

§. 3. The slow, or hedge-peak-bush is apt to die in the hill-country, where the land is poor, and they are let to grow in the hedges till seventeen or eighteen years growth, before they are cut : therefore the best way of preserving such hedges is to cut them at eight or nine years growth. The stones of these also should be sown in nurseries.—Mr. Evelyn excepts against black-thorn being mixed with the white, because of their unequal progress.*

§. 4. By

* Mr. Miller gives the following directions for raising quick-hedges.——The sets ought to be about the bigness of one's little finger, and cut within about four or five inches of the ground ; they ought to be fresh taken up, strait, smooth, and well rooted. Those plants which are raised in a nursery are to be preferred.

Secondly, If the hedge has a ditch, it should be made six feet wide at top and one and an half at bottom, and three feet deep. that each may have a slope ; but, if the ditch be but four feet wide, it ought to be only two feet and an half deep ; and, if it be five feet wide, it should be three feet ; and so in proportion.

Thirdly, If the bank be without a ditch, the sets should be set in two rows, almost perpendicular, at the distance of a foot from each other.

Fourthly, the turf is to be laid with the grass-side downwards, on that side of the ditch the bank is designed to be made ; and some of the best mold be laid upon it to bed the quick ; then the quick is to be laid upon it, a foot asunder ; so that the end of it may be inclining upwards.

Fifthly, When the first row of quick is laid, it must be covered with mold, and the turf laid upon it as before, and some mold upon it ; so that when the bank is a foot high, you may lay ano-

ther

§. 4. By all means set your dead hedges at a good distance from your quick-set plants, not only on account of preserving your plants, but your dead hedges also : for, if great cattle have any likelihood of reaching your plants, in reaching after them, and pressing

ther row of sets against the spaces of the lower quick, and cover them as the former was done ; and the bank is to be topped with the bottom of the ditch, and a dry or dead hedge laid to shade and defend the under plantation.

Sixthly, There should be stakes driven into the loose earth, at about two feet and an half distance, so low as to reach the firm ground. Oak stakes are accounted the best, and black-thorn and fallow the next : let the small bushes be laid low, but not too thick, only a little to cover the quick from being bit by cattle, when it springs, and also lay long bushes at the top to bind the stakes in with, by interweaving them. And, in order to render the hedge yet stronger, you may edder it, as is called, i. e. bind the top of the stakes in with some small long poles or sticks on each side ; and, when the eddering is finished, drive the stakes anew ; because the weaving of the hedge and eddering is apt to loosen the stakes.—The quick must be kept constantly weeded, and secured from being cropped by cattle ; and in February it will be proper to cut it within an inch of the ground, which will cause it to strike root afresh, and help it much in the growth.

The following is Mr. Franklin's method of planting quick-hedges, as given us by Mr. Miller.

He first set out the ground for ditches and quick ten feet in breadth ; he sub-divided that by marking out two feet and an half on each side (more or less at pleasure) for the ditches, leaving five in the middle between them : then, digging up two feet in the midst of those five feet, he planted the sets in ; which, although it required more labour and charge, he says, he found it repay the cost. This done, he began to dig the ditches, and to set up one row of turfs on the outside of the said five feet ; namely, one row on each side thereof, the green side outmost, a little reclining, so as the grass might grow.

After this, returning to the place he began at, he ordered one of the men to dig a pit of the under-turf mold, and lay it between the turfs placed edgewise, as before described, upon the two feet, which was purposely dug in the middle, and prepared for the sets, which the planter set with two quicks upon the surface of the earth, almost upright, whilst another workman

preffing upon the dead hedge, they will break it down a year sooner than ordinary, and learning such a habit, and finding the fuccess, they will not afterwards be broke of it.

For the two first years, says Mr. Evelyn, to diligently

laid the mold forwards about twelve inches, and then set two more, and so continued.

Thus being finished, he ordered another row of turfs to be placed on each side upon the top of the former, and filled the vacancy between the sets and turfs as high as their tops, always leaving the middle, when the sets were planted, hollow and somewhat lower than the sides of the banks by eight or ten inches, that the rain might descend to their roots; which is of great advantage to their growth, and by far better than by the old ways, where the banks are too much sloping, and the roots of the set are seldom wetted, even in a moist season, the summer following; but if it prove dry, many of the sets, especially the late planted, will perish, and even few of those that had been planted in the latter end of April (the summer happening to be somewhat dry) escaped.

The planting being thus advanced, the next care is fencing, by setting an hedge of about twenty inches high upon the top of the bank on each side thereof, leaning a little outward from the sets, which will protect them as well, if not better, than an hedge of three feet, or more, standing on the surface of the ground; for, as these are raised with the turfs and sods about twenty inches, and the hedge about twenty inches more, it will make three feet four inches; so as no cattle can approach the hedge to prejudice it, unless they set their feet in the ditch itself, which will be at least a foot deep; and from the bottom of the ditch to the top of the hedge about four feet and an half, which they can hardly reach over to crop the quick, as they might in the old way; and besides, such an hedge will endure a year longer. — Where the ground is but indifferent, it is better to take twelve feet, for both ditches and banks, than nine or ten; for this will allow of a bank at least six feet broad, and gives more scope to place the dead hedges farther from the sets; and the ditches, being shallow, will in two years time, graze.

As to the objection, that taking twelve feet wastes too much ground, he affirms, that, if twelve feet in breadth be taken for a ditch and bank, there will be no more ground be wasted than by the common way; for in that a quick is rarely set, but there are nine feet between the dead hedges, which is entirely lost all the

gently weed is as necessary as fencing and guarding from cattle.

§. 5. To steep cow-dung and lime in water, and to sprinkle young hedges with it, is supposed to prevent cows and sheep from browsing them; and it is good to serve hedges the same with horse-dung, where horses feed, and when it is washed off by the rain, to renew it.—The end of mingling lime seems to be, to make the liquid stick, and to bind it.

Of sprinkling young hedges with cow-dung and lime water.

§. 6. If a hedge by ill usage, or by age, be grown thin, the best way is to cut it close to the ground the year you sow it with wheat, and to fling earth to it, to refresh it, and to make a dead hedge without it; by this means the old stems will tillow afresh and thicken; whereas by plashing, unless a hedge be thick enough to afford the lois of young shoots, by dropping on them, they will be killed. But in doing this you must not cover the stems with the earth you fling up, lest you choke and kill them; if you intend therefore to lay a great quantity of earth to the roots, you must leave the stems somewhat the longer.

Of thickening a hedge.

The digging a trench or ditch by flinging fresh mold to the stools of an old hedge is of special use, forasmuch as the trench, laying many of the roots of the old hedge bare, makes them send forth shoots, whereby the hedge is thickened; for roots turn to branches when exposed to the air.

Take a well-rooted set of holly, of a yard long, and strip off the leaves and branches, and cover

the time of fencing; whereas, with double ditches, there remain at least eighteen inches on each side where the turfs were set on edge, that bear more grass than when it lay on the flat; but admitting three feet of ground were wasted, he shews the damage to be inconsiderable. He then compares the charges, and asserts, that forty poles planted in the old way will cost seven pounds, and the same measure in the new way but three pounds.

them

them with a competent depth of earth, and they will send forth innumerable quantities of suckers, and quickly make a hedge. — Mortimer, fol. 4. — A holly or other ever-green, if striped or blanch'd in the middle of the leaf, will in time lose it's stripes, and the natural green will overcome; but, if the edges of the leaves are white, they will always so continue; therefore the latter is three times more valuable than the former, and this is the difference the gardeners make.

Of plashing a hedge.

§. 7. ^b In plashing a hedge, round a hedge-row or coppice, leave the plashers of the hedge within side the coppice, and turn the brushy part to the close, that it may not injure the young shoots by dropping on them, and that the cattle may not come at the shoots of the plashers, and browse them, and kill them.—Take care also to set the stakes outwardly, and off the shoots, whereas the hedgers for riddance, and for sake of making stakes of the live standards, work the plashed hedge strait on, most likely through the middle-most part of the hedge, which must drop over your young shoots arising from the stools, and leave many without, exposed to the ground, to be fed; though by this means you make the more luggs of hedge, yet the good husbandry of it will repay you.—Plashing work for the most part ought to be ended early in April; because, as soon as the bark loosens by the sap, when the plash is bent back in the cut, it hollows, and gapes from the

^b In plashing quicks, says Mr. Miller, there are two extremes to be avoided; the first is laying it too low, and too thick: because it makes the sap run all into the shoots, and leaves the plashes without nourishment; which, with the thickness of the hedge, kills them.——Secondly, it must not be laid too high: because this draws all the sap into the plashes, and so causes but small shoots at the bottom, and makes the hedge so thin, that it will neither hinder the cattle from going through, nor from cropping it.

wood,

wood, and so is apt to die, because the sap cannot be conveyed to it. Withy and ash will first take damage by late plashing, because the sap first rises in those kinds of wood. But as to the cutting down a quick-hedge, if it be the latter end of April, it will shoot as soon, if not sooner, than that cut in the winter. — It is too common to see withy and ash-plashes dead in hedges, which comes from their being plashed too late.

It being frosty weather in November (anno 1700) yet my woodward was for going on with a dead hedge I was making: I said, surely it would be very improper, and that the wood would not work, but would snap by means of the frost. — But he answered, no, that was a mistake, it was plashing that was improper in hard frosts.

The white-thorn in hard frosts will be so brittle as in bending to break like a rotten stick; but the black-thorn, withy, and crab-tree will endure bending in the hardest of weather.

As I was riding with Stephens, he went to pull up a large brier, which by it's length had bent downwards to the ground, and had at the end struck forth plenty of new roots; from whence it may be observed how apt they are to propagate: I also conclude any other part of a brier that touches the earth will be apt to strike new roots, and so it may be useful in some vacant places by plashing to encourage them. — In wet summers, when the ground is open and moist, as this year (anno 1703) they propagate abundantly; but in dry summers they are not so plentiful.

§. 8. If an hedge has been in ill hands, and often bit, and abused by cattle, and is an old hedge; if you cut down this hedge, that it may thicken, and grow better, remember not to cut it down too low, not so low as the old stem, but leave some little length, about three or four inches of the thriving
and

Of cutting
an old
hedge to
thicken it.

and younger wood standing on the old stem, for, if you cut below that, the old stem often happens to be near rotten, and the tubes that convey it's juices to the young roots are but few, and their springs are easily lost, if you divert them from their common current, and channel, and the coat and bark of the stem is commonly so case-hardened, that no bud can break through ; whereas by leaving a little part of the young wood on the old stem you preserve the old channels of the tree, and they carry a bark with them sappy and easily perforable by a bud. — N. B. I once lost a hedge by cutting it down too low.

Of stakes
for fences.

§. 9. Oak-lops and hollow pollards cleaved make excellent stakes for fences, and, considering their lastingness are the best husbandry, or if two of these stakes are placed in each lugg, they will greatly preserve the rest of the hedge. Withy will rot the soonest of all wood, and a small hazle-stake will last longer in a hedge than a great withy : but an ash-stake, next to oak, will last longest.

Of making
a dead
hedge too
thick.

§. 10. I was walking between the coppices with my woodward, and he bid me take notice of a hedge on one side of the way, and said, he had advised the making it so thin as it was, and it was now five years since it was made, and yet it stood well ; whereas, said he, by and by you will come to a fence-hedge of the coppice, not made longer ago, which is rotten and down ; for your labourer would make it too thick, and cram in abundance of wood, whereby the wet lodged in it, and made it rot much the sooner.

Hedges
not to be
made in
frosty wea-
ther.

§. 11. Hedging ought not to be done in frosty weather, for with the bar they cannot make holes for the stakes to go into, but what stakes must be less than the bar, nor can they be drove farther than the pick of the bar ; and upon the first thaw the hedge will sink away and fall.

Of splitting
rods for
hedging.

§. 12. When you make a hedge, it is adviseable

to split the rods, for you may observe the unsplit rods in a hedge grow speckled by the sap oozing through in spots, which opens and loosens the pores of the wood, and prevents it from clinging, and binding, as it does when split; for then the sun dries it up with all it's sap, and is next of kin to burning the posts-ends of gates; which dries the inmost sap out of the posts, that would rot them, and gives a cole of that depth to the outside, through which the moisture of the earth does not soak.

§. 13. In the spring, during March and good part of April, I find it very useful to view carefully all over those sort of hedges which may need repair, and not only mend where there is an immediate necessity, but wheresoever also they may decay before harvest; as also all such hedges, where though you can receive no trespass till harvest, by reason they border on other corn, or mowing-ground, yet are liable to it in harvest, when grounds must lie open; these you ought to mend, for men cannot be then spared, nor can you then get wood.

§. 14. It is a common practice in the hill-county to cart hedging-wood, and sling it down in great heaps, perhaps half a load in a heap, and to suffer it to lie, perhaps a month or two, before it is hedged up, to the great detriment of the wood; which by so lying on the ground and receiving the rain and rime, which commonly fall there, and being imper-viable to the wind and sun to dry it, soon rots, and suffers more by so lying in such thick wads a month or two in the field, than it would have done in three times the time in the coppice, where it lies on the roots, and is thereby kept hollow from the ground, and lies thinner, whereby the wind can soon dry it after rain.

§. 15. Farmer Farthing of the Isle of Wight exceedingly commends the cleft timber-hurdles for a fold, and that they are beyond rod-hurdles; he says, Time of mending hedges. Caution— not to let hedging-wood lie long in heaps on the ground Rod hurdles not so good as those of cleft timber.

he has had the experience of them both, and the former go much beyond the latter in cheapness, though at the first hand they are dearer : besides, he says, with the rod-hurdles he has had a sheep spoiled and staked by leaping over the fold, and this he has known pretty often.

Of rods.

§. 16. The goodness of rods depends greatly on their straitness without knots ; such will last half a year the longer for being so, besides, the more knotty rods are, the more will the sheep rub off their wool against them.

My labourers were twisting some hazle-rods, which were apt to break, of which they complained : they were red-hazle, not white ; I asked them the difference, they replied, it was very great ; for the white hazle might be seen by the white bark, and the red by the red bark : the white hazle will twist ten times better than the red, being tougher, and consequently abundantly better for all sorts of hurdling work, and for the winding of a hedge, and for spars for thatching ; nay, said they, the white will last near a year longer in hedging. To this my woodman seemed to agree, and so did another experienced woodman, whom I talked with the next day ; only the latter said, he did not know that the white had any advantage of the red in hedging, but only in hurdling, where the rods were to be twisted.

Of hedges.

§. 17. Where great cattle pasture never trust to a patched, or a half-made hedge, you will continually be making good the trespasses, and the cattle will get a vicious habit, of which you will never after break them.

If a hedge needs patching, and is to be a fence against hogs or great cattle, especially where water and shade are wanting, it is much the best husbandry to make it all new, though the rest may be tolerable, and some of it seemingly sufficient for another year, for a declining hedge will decay more in a year

than

ORCHARD or FRUIT-GARDEN.

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than one can easily imagine : and if such cattle find any one place of it weak enough to be forced, the strongest part will never stand against them ; so that you will be daily patching such a hedge, and at times when you can ill spare a servant, suppose in hay-making or harvest-time ; and at last you shall have a continual patched hedge from year to year, wherein there will be some parts you will think too good to pull down, and yet no part of it good ; whereas in mendings wood cannot be so well joined as when it is worked into an intire hedge at once.

Dividing open fields into inclosures by quick-set fences, where ten acres of strong land is divided from thirty acres of light land, and the like, is a real improvement, in respect that a tenant will give much more for the lands so divided : whereas before the good land was swallowed up by the poor land ; nor could the light and poor land be ploughed as often as the strong land, nor the strong land so seldom as the poor land, without reciprocal inconveniency.

If your corn-grounds, that lie contiguous, are well fenced against each other, you will have thereby the advantage, as soon as the corn of one field is rid away, to put in cattle, or hogs, to eat up both the grass and loose corn ; whereas otherwise your cattle may be kept out a great while, when they need it, till other ground be rid.

ORCHARD or FRUIT-GARDEN.

§. 1. **D**O not steep seeds of trees in water, as some may advise you ; for it is not good to steep any sort of seed, unless some annuals, and to steep them is good, especially if late sown ; but to steep stones, nuts, or seeds, that are not of quick growth, in water may kill them, by making the kernel swell too hastily, and so crack it before the
Not to steep seeds except some annuals.
spear

spear can do it, or it may mould or stupify the spear. Cook, fol. 63.

§. 2. The antients always preferred orchards to pastures, and pastures to arable. See Varro, fo. 32.

Of plant-
ing apple-
trees in
the hill-
country.

§. 3. In our hill-country, where we are on cold clays, or else the earth is so poor that it's vegetable particles are not copious, nor very active, it has been observed that apple-trees are very hard to be raised, unless the crab-stocks be planted where they must remain two years before they are grafted, or rather unless the crab-kernels be sowed where they are to continue unremoved, and so grafted. — Probably the reason for this may be, because there is a considerable knot of transverse fibres where the graft is jointed, through which the juices and vegetable particles find it a very hard task to pass, where the juices of the ground are cold, as in clay-lands, or the particles of vegetation less copious and active, as in poor lands, especially when the stock itself being planted after it's being grafted, must be supposed to receive a check, and it's tubes some streightness by closure, and therefore cannot admit a free passage of juices upwards to the graft: whereas when the stock has been planted two years, and it's roots settled, the juices may have a vigorous passage, and so can easily force their way through the fibres where the graft knits: yet where there is a mellow ground, or a rich fat sand, there the vegetable corpuscles rise so strongly and plentifully, and the juices of the earth are so thin, that they can easily pass upward to the graft through the knot, and in such a happy soil a tree planted after being grafted may do well.

Of trans-
planting
crab-
stocks.

§. 4. I by no means think well of removing crab-stocks out of the woods and transplanting them; because such stocks, when they come to be exposed to the open air, and taken out of their shelter in the
warm

warm woods, do not bear the cold winters well, nor even the summer suns.

§. 5. Your cuttings for planting should be from half an inch to a whole inch diameter; for, if they be less than half an inch, they will be weak and have a great pith, which will take wet and be likely to kill your cuttings; and besides, when your cuttings are too small, they are not prepared with those pores, that is, little black specks on the bark, where the roots break out, it set in the ground; a sign that those that have that mark on them will grow, as elder, alder, fallow, water-poplar, &c. and if they be too young they will not have that burry knot which is very apt to take root: and if they are above an inch diameter the tops of your cuttings will be long in covering over, and so may decay by the wet. Cook, fo. 12.

§. 6. The French gardener translated by Evelyn, Of grafts, fo. 54. says, the best grafts are those which grow on the strongest and master-branch of a tree, and which are wont to be good bearers, and such as promise a plentiful burden that year, being thick of buds; for hence it is that your young grafted trees bear fruit from the second or third year, and sometimes from the very first; whereas, on the contrary, if you take a graft from a young tree, which has not as yet born fruit, that, which you shall propagate from such a cyon, will not come to perfection a long time after.

I went with my gardener into my crab-stock nursery, to choose some stocks for grafting on: I had some that came from another nursery, and others that I had raised from crab-kernels; but had never been removed; these seemed to be the most flourishing, and on these I would have had him grafted; but he refused, saying, that they had only a tap, but no fibrous or bushy roots, and therefore, when removed, would not be able to feed their stock and

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graft. — Not, such stocks removed may be well able to maintain themselves, but it is a different thing to maintain their grafts, and forcibly transmit juices enough thro' the knot of the graft, where the fibres run transverse.

Cyons grafted upon suckers are more disposed to produce suckers than grafts on the main stocks do. Ev. 140.

In January or February, as you find the weather grow warm, the wind neither being north nor north-east, you may graft cherries or plums, but not apples till the bark of the stock will rise or peel from the wood, which is seldom before the middle of March, and often not till April: this is the best way of grafting them, but if you will graft apples in the cleft, you may do it sooner. Langford, fo. 46.

The great use of grafting by approach is, where trees (such as the vine, or ever-greens) run so much to juice, that the graft cannot easily consolidate to the stock by reason of the great fluidity of sap; there by length of time and patience it will consolidate by approach.

Of budding.

§ 7. I gathered withy-shoots over which the cart-wheel had run, and pressed them flat, in which shape they continued to grow, and the sap swelled through their fibres, and rising higher there than in other places of the bark, plainly shewed, that the sap is conveyed by those fibres, to each of which in their progress broke forth a bud sooner or later, and it was to be observed that the fibre lessened extremely as it passed on, after it's having sent out it's bud, not being able farther in it's whole progress to send out another; for all buds that appeared above being well observed, could be perceived to be collateral, and to belong to some parallel fibre, though sometimes the bud above might seem to turn athwart the fibre of the lower bud, and hang perpendicularly

perpendicularly over it. — From hence may appear the reason why an inoculated bud may not take, viz. because it is not placed on a fibre; therefore care is to be taken to place the inoculated bud perpendicularly under another bud, that it may be fed, and not over, lest the under bud weaken the fibre that passes from it, and it should not be able to feed the inoculated bud.

Mr. Bobart of Oxford tells me, he once inoculated a blossom-bud of an apricock, and the blossom grew to be a ripe apricock.

To bud a walnut-tree, when five or six feet high, doth not alter the property of the wild kind, but makes the tree more naturally bear fruit, both sooner and better too. Cook, fol. 61.

I know Lord Bacon tells you, that peaches come best of stones unbudded; but I advise you to bud all you raise of stones, seeds, &c. though it be to take a bud off from the same stock, and to bud it on that, as I have often done. Cook, fol. 61.

Currants and gooseberries may be inoculated on their own kind. Mortimer, fol. 455.

§. 8. As good pruning helps the growth of trees, so also doth it prolong their lives: for it is well known that the pruning some annual plants will make them last more than one year. Cook, fol. 1.

Le Gendre says, a gardener ought not to prune the large shoots of some trees, such where the sap is very plentiful by being in good ground: for, if the sap be stopped ever so little, it will cast itself into the buds, which would have born fruit, and make them grow into wood; therefore he ought to manage it so as to leave neither the foot nor body of the trees too much unfurnished; for this reason he must rather cut the tall-shooting branches, unless in the case above, too short, than leave them too long, taking most from the highest branches, and such as are to-

wards the top of the wall, because these draw all the sap to themselves, and leave the bottom of the tree unfurnished: this is the cause that peach-trees are so difficult to be kept, experience teaching us, that, if the gardener does not perfectly understand the way of cutting them, and taking their sprouts away as they ought to be, they will be ruined in six or seven years. fo. 127.—Frees, to be well pruned, must have their boughs every year refreshed more or less, according to their force, by cutting away the wood that springs in the month of August, which being the shoot of the latter sap, cannot be ripened, unless it be necessary to preserve it for want of better, or that it be found to be strong and well nourished. fol. 127.—Those boughs also that shoot too fast must be stopped and kept shorter than the others, for they draw all the sap to them and wrong the rest that are weaker: but the master bough must always be preserved, being that which grows straight upwards, so stopping it from year to year that it may always be the strongest, and maintain the shape of the tree: those boughs also, which are weak and small, must be shortened, and those, which are disposed to bear fruit the following year, to the end that they may grow strong, and that their buds may be well nourished. ib.—It is farther necessary to prune those branches that are full of fruit-buds, for too great a quantity of blossoms consumes the tree, besides that from thence the fruit comes less fair; but in the pruning of these it must be observed to cut them above a leaf-bud, and as near to it as may be, for two reasons, the first is, because by that means the fruit will profit most, for, when it is not covered with leaves, it dries, and seldom arrives at its natural perfection: the second reason is, because so the branch will recover itself that very year; whereas, if it be cut higher, and far from a leaf-bud, there will remain

remain a little stub at the end of the twig, which dries up, and cannot recover itself in two or three years: as for such boughs as are taken wholly off, they must be cut as near the stem as may be, for so they will recover the sooner, and that without making any knot. fo. 129. — The pruning of peach-trees must be the last of all, and then, when they begin to spring, and are ready to flower; because their young wood is so tender, that, if it be cut, it will be dried and spoiled upon the least frost, from whence a great many of the smaller twigs die, and must oftentimes be cut again. ib. — Plum-trees and cherry-trees must not be cut, or stopped on the sap, but only cleared and discharged of their useless wood within the tree: and for this reason they are not proper to be kept as bushes or dwarfs. fol. 131.

Some trees are so apt to run to bearing, that thereby they will ruin themselves in a very few years; to diminish this, their heads must be cut off, or their boughs shortened to the half, and for two or three years all their buds taken off, for by this means, provided their roots be lively, they will grow much into wood. Le Gendre, fol. 149.

§. 9. It will be necessary every year to prune and nail wall-fruit to the wall twice or thrice, according as they grow more or less, in doing which you must observe, to bend down the strongest shoots that would grow upwards, towards the sides, otherwise they will be apt to run straight upwards, and not cover the space you design for them, and by their luxurious growth will extremely rob the side-branches of their nourishment; there will branches enough spring out fresh to run upwards out of them when they are so bowed. Langford, fol. 54.

§. 10. A tree, says Le Gendre, draws its nourishment only from the small roots. fol. 136. — When it is necessary to dung apple-trees, peach-trees, Of dung ing apple, peach, and apricock trees.

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trees or apricock-trees inoculated on a plum-stock, or pear-trees grafted on a quince-stock, it is enough to spread the dung upon the ground six feet about the stem, and so to dig and work the earth and it well together, for these spreading near the surface of the earth are easily sensible of the amendment. fol. 138.

Many farmers in the Isle of Wight thresh winter-vetches for their breeding-pigs, and give them to them in the winter; and one that I know in particular gives them the vetches round about his apple-trees, and says, their soiling, or nussing, and keeping the grass and weeds down, or digging and hollowing the ground, is the reason why his orchard brings apples every year when others fail.

§. 11. In cold countries both the bark of trees, and the rind of fruit is thickest: so it is plain of later peaches, &c.

Faves serviceable in blossoming-time.

§. 12. * This spring (anno 1708) was very wet and cold, with frosty mornings, especially at apricock

* This observation is agreeable to the instructions given by Mr. Miller, under the article Blight.—“There is a sort of blight, says he, against which it is very difficult to guard our fruit-trees; this is sharp pinching frosty mornings, which often happen at the time when the trees are in flower, or while the fruit is very young, and occasion the blossoms or fruit to drop off; and sometimes the tender parts of the shoots and leaves are greatly injured thereby. The only method yet found out to prevent this mischief, is, by carefully covering the walls, either with mats, canvas, reeds, &c. which being fastened so as not to be disturbed by the wind, and suffered to remain on during the night, by taking them off every day, if the weather permits, is the best and surest method that hath yet been used in this case; which, although it has been slighted and thought of little service by some, yet the reason of their being not so serviceable as has been expected, was because they have not been rightly used, by suffering the trees to remain too long covered; by which means the younger branches and leaves have been rendered too weak to endure the open air, when they are exposed to it; which has often been of worse consequence to trees than if they had remained

cock and peach-blossoming time, inasmuch that rain would fall in the night and freeze in the morning; the consequence of which was, that apricocks were six and eight shillings a dozen: but an ordinary neighbouring man to me, who had an apricock-tree next his house, being watchful of most contrary seasons, and finding the benefit of nursing his tree under difficulties, did by night cover it with rugs and blankets from the rain, the consequence whereof was, he had thirty dozen of apricocks on his tree: his name was Timothy Skrine, of Broughton near me in Wiltshire.—I also observed that year in some few places some thatched eaves, which hung a foot and an half over some garden-mud-walls, where were good store of apricocks and peaches; and I judged they owed their fruitfulness to these causes, for they were thus shaded from the rain, which falling at night into the blossoms of others, and congealing,

remained intirely uncovered. Whereas, when the covering before mentioned has been performed as it ought to be, it has proved very serviceable to fruits; and many times, when there has been almost a general destruction of fruits in the neighbouring gardens, there has been a plenty of them in such places, where they have been covered: and though the trouble to some may seem to be very great, yet, if these coverings are fixed near the upper part of the wall, and are fastened to pullies, so as to be drawn up or let down, it will be soon and easily done: and the success will sufficiently repay the trouble.

The latter part of Mr. Lisle's observation may seem favourable to horizontal shelters, but, if rightly considered, it implies no more than Mr. Miller has allowed; for it is far from concluding that they ought to be fixed and constant, or that walls should be built in that manner, nor does it assert any thing of the goodness of the fruit, but only of the quantity. He brings these instances of the projecting eaves to confirm the opinion he had delivered before, viz. that the plenty of fruit that year on some trees was owing to their having been protected from cold winds, rain, and frosts, in the time of their blossoming; but, notwithstanding this, fixed horizontal shelters may, at other times, and in other respects, be very prejudicial both to the fruit and the trees, as Mr. Miller has shewn both from reason and experience.

burned them up and mortified them; and how they piecemeal mortified, the morning after was very visible. — The 17th of August I was at Oxford in Mr. Bobart's physic-garden; I related the matter to him with my reflections on it. — He was pleased with the relation, and said he would carry me to an object which should confirm my opinion: he shewed me the house he lives in, planted on the walls of the physic-garden, on which walls, as far as his house goes, is a large eaving to his house, which saved his peaches from the north wind and the rain, so far as his house went, and so far he had good stock of peaches on several trees, but no farther; and the end of his house reaching to the middle of a tree, the fruit ended there.

Plums
that come
from the
stone chop
in cold wet
weather,
others do
not, and
why.

§. 13. This year (anno 1720) the spring and summer to August the 13th (when this was wrote) was often very rainy, and the days for the season of the year very cold, it was observable, that in my kitchen-garden, where the land was very good, the plums which were standards, and did cleave from the stone, such as the Orleans, the Damascenes, the the Queen-mother, &c. did all chop in several places, not, as I believe, one plum on a tree excepted, and gum issued out of the chops; but a violet-plum, a standard there, which is a plum that does not cleave from the stone, did not in the least chop: it was farther observable, that such plums as grew against the walls, and did cleave from the stone, though they grew against a north-west wall, did none of them chop. — And the same observation I have made other years, in cold and wet summers: it may also be added, that the soil in my kitchen-garden was full as good, and as well maintained as the borders of my plum-trees against the north-west walls: from this experiment I draw the two following conclusions, viz. that the reason why the plum that did cleave from the stone in my kitchen-garden did chop,

chop, was, because such plums, which cleave from the stone, are of a drier pulp, and do not overflow so much in juice as the violet-plums do, and those which do not cleave from the stone; and therefore, through the wet and cold seasons of the year, the spirituous juices, which can only strain through the stalk of the plum, being not rarified, through want of heat, could not ascend, and so those plums, dry in their nature, being now made more so, for want of moisture chopped: but moisture enough ascended the violet-plum, though less than in other years, which by nature overflowed with juice, to preserve that from chopping.

The second conclusion is, that the much rainy and cold weather, to both which the standard-trees were exposed, was the only reason and cause of this circumstance of the chop in the aforesaid plums, and made the difference between the standard-plums, and the plums against the north-west wall; for though the situation against such exposition one may think very cold, as not having so much benefit of the sun from all quarters, especially from the east and south aspect, as the garden-standards had, by which means the garden-standards were on as good, if not better footing in hot and dry summers, yet in such a cold and wet summer as this was, the cloudy weather which intercepted the sun, and the cold windy and rainy weather, from which the plums under the north-west wall were very much defended, so chilled the juices, as to produce the ill effects above-mentioned.

I have seen fruit-trees standing in hedges pallifade-wise, in some particular part of which hedges, possibly for a lug or two, the trees every year blighted: I have known new earth to be laid to the roots, and the old to be removed, without effect: then I have known new trees to be planted in their room, yet
still

still the evil has continued. In such cases I have always observed the position of the place to be the disease, either that there has been a repercussion of an easterly wind from a piece of wall on the place, or some angle which has turned the strength of a malignant wind on it, which cause being removed the effect ceased.—I was speaking to Mr. Bobart of this, and he said, that London the king's gardener had told him, that he was at Versailles, and observed that the king of France for this reason could have no fruit. ^b

G A R D E N.

Of the rose. §. 1. **T**HE common damask-rose is the ancient inhabitant of England. Mortimer, fol. 477.

I was telling my gardener how much fruit depended on the leaves of the tree, &c.—he added, that in the monthly rose he could stop the progress of it's blossom a month by pulling off the leaves of the tree; for it would not blow again till it had put forth fresh leaves.

Of wood-
bines.

§. 2. The woodbines or honey-suckles in my borders have not thriven, but for the most part died yearly, and I have been forced to renew them; I first thought our country was too cold for them, but at length I was rather inclined to think our soil was too dry and too hot, our garden being much exposed to the south sun; so I laid heaps of grass to the roots, and quickly found it to have success.—Agreeable to this seems Mr. Ray, *Historia plantarum*, vol. 2. fol. 1490. *Hæc species in septentrionalibus regionibus, Germaniâ, Angliâ, Belgio, &c. in sepibus frequens.*

^b See the article, Water and Watering, from §. 5. to the end.

§. 3. I

§. 3. I would have those that lay salt on their gravel-walks, to kill the weeds, to observe, if in a few years they do not produce more weeds than those gravel walks that had had no salt laid on them did. For the salt at first stupifies the roots, as being more than they can digest, till washed in by the rain and qualified. Cook, fol. 18.

Of salt laid
on gravel
walks.

K I T C H E N - G A R D E N.

§. 4. Worlidge, fol. 257. says, removing of plants, and alteration of the soil is a good way to improve them; several esculents grow the fairer for it, as cabbages will not leaf well in case the young plants be not three or four times removed before the spring, the same is observed in lettuce, onions, and several others, if they are removed into improved earth every time, they will eat the tenderer and finer.

Of improv-
ing plants
by remov-
ing them.

§. 5. Columella recommends ashes to be laid on artichoke beds, which he says is extremely beneficial to that plant*. But Mr. Powel the gardener was a stranger to the agreeableness of that manure to them.

Ashes good
manure for
artichokes.

§. 6. The latter artichokes will keep till autumn, if you cut them before they are ripe or going to blow, but it must be in a dry season, and when they are very dry, and hang them up in a cellar; for they will keep growing on, and blow, and feed: I have known them kept so two months; or you may cut the spring-artichokes when half ripe, and then they will bear again at autumn.

Of keeping
artichokes.

§. 7. Carrots and parsnips are said to delight in different soils; viz. carrots, in sandy and the lightest ground, parsnips, in the strongest land.—Mr. Ray agrees to this, for he says, the carrot delights

Of carrots
and par-
snips.

* Cinara multo cinere stercoreandum, id enim stercoreis huic oleri videri aptissimum. Columella.

in gracili solo, but the wild parsnip in solo pingui & opulento. It is a good property in a carrot to be thick and short.

If carrots and parsnips are not gathered as soon as they come to their perfection in growing, which is to be known by the withering of their leaves, the worm will eat them, which will cause a canker.

Of cab-
bages.

§. 8. One of my labourers put me in mind of earthing up my cabbage-plants; I knew they would thrive the better for it; but he said, it would make them take fresh roots, whereby they would better in their stem support their cabbage-heads, which otherwise would be flung by the wind.

Of trans-
planting
herbs.

§. 9. Markham in his book of husbandry, and skill in cookery, p. 51. says, that herbs growing of seeds may be transplanted at all times, except chervil, orage, spinage, and parsley, which are not good after being transplanted; but observe to transplant them in moist and rainy weather.

Of liquo-
rice.

§. 10. Glycirriza, or liquorice, Mr. Ray says, rarius autem in Germaniâ aut Angliâ floret, ideoque sterilis a nonnullis sed temerè credita. Now English liquorice being the best, shews plainly the perfection of the root has no affinity with the perfection of it's taste; for no doubt but the root of liquorice grows more perfect, that is, larger, in those countries where the plants flower and bear fruit, though there it may eat more sticky and stringy, and be less pleasant in taste: so that the perfection in the taste of the root may be a defect in it.

Of onions.

§. 11. Sharrock in his book of vegetation says, that English seed of onions brings but scallions or small onions. I find this to be true, and that they will not keep long, but grow soft, and rot in three weeks time after they are taken up.

W E E D S.

§. 1. **F**ARMER Chivers of Gausuns in Wilts says, the thistles came at first ^{Of foddering with weedy straw.} there, as in other rich pastures, from the ill husbandry of the farmers, who in hard winters foddered with thistly straw, or thistly coarse hay, and from thenceforward they have increased to a great degree. — I remember that by foddering in my meads, in a very dry summer, with goar-vetches, I filled my meads with morgan and other trumpery.

§. 2. Poppy or red-weed seldom grows in the deep ^{Of poppy or red-weed.} and wet lands of Hants, nor in the deep lands in Leicestershire, nor indeed do the plants which come up from the smallest seeds, such as rue, whitlow-grass, &c. grow in strong lands, but in the lightest lands, which are consequently the barrenest; because those small seeds are easily oppressed in strong or wet lands, nor are the vegetative particles heated, and thereby refined enough to penetrate the pores of their seeds.

§. 3. The farmers do not in the last crops lay down their lands to clover in the strong and deep ^{Of killing weeds.} soils of Northamptonshire, because they would then be prevented (if they made any benefit of their clover the next summer) of taking so effectual a remedy by an early summer-fallow, and after that of giving their lands a second tillage, perhaps to destroy the withwind (which I have often observed to trouble them) and other such ill weeds as are apt to grow up with their wheat, if not subdued by an early summer-fallow. After all it must be confessed, that nothing is better husbandry in our strong clay-grounds in the hill-country than to keep them in tillage, and not to suffer them to run to a sword of natural grass, which is prevented by ploughing up

up the first summer's clover to a wheat-crop, about the beginning or middle of August, after you have in a manner had the benefit of the summer-crop; and yet this practice is subject to the inconveniency of cultivating the weeds such sort of land is subject to, especially when it shall be folded or dunged, as wheat-land ought to be. Therefore it seems a medium ought to be taken in this case, and you ought to observe carefully what sort of ground is subject to what sort of weeds; for some of my clay-grounds are not subject to withwind, and some of my light and white grounds are not subject to morgan or red-weed as others are, and yet I can see little difference in the grain of the land; accordingly you may suit your husbandry, in humouring your grounds, and venturing the aforesaid method in one ground, which for the foregoing reasons you ought not to risque in another: again, it often happens in our hill-country-land, we have several sorts of earth in the same field, as strong red clay, some mixed earth, and some white; in such case, when in the course of husbandry you should lay down your last crop of corn to clover, you may forbear sowing that part of the field which is of strong clay to clover, that you may not be hindered from doing that which perhaps may be most for your benefit; viz. of giving it an early summer-fallow in order for a wheat-crop. Again you must be nicely careful of giving such lands as are subject to weeds the first frosty fallows of the winter ploughings every year that they are sown to barley, oats, or peas, in case you fallow for peas: by this method you will in time gain in a great measure a dominion over those sorts of weeds, which otherwise would eat out and overtop your corn.

Sowing clean seed, and laying grounds down to grass-seed, will at length overcome all manner of weeds,

weeds, whereby the heart of the ground is eaten out; and the more in heart you accustom to lay down your grounds to grass-feed, the thicker the grass or clover will grow, and the better effect it will have.

Mr. Ray speaking of ludweed (with which the fields at Crux-Easton are very much troubled) says, it grows chiefly on dry, barren, and gravelly ground. — If so, it seems it may be extirpated by improving the land by good husbandry: and it seems to be the same with all other plants that affect barren and poor ground; the juices being poor and sour that they feed on, they go off of course by making the land generous: and indeed good healthy land seems much easier to be cured of the weeds incident to it than poor land, without altering the condition and property of each sort, because colt's-foot, docks, wild carrot, parsnip, &c. excepting the thistle and knapweed, may easily be destroyed by being prevented from seeding; whereas the plants of barren grounds being both small and infinite, the labour of destroying them would be also infinite without altering the property of the ground. Therefore the consequence of ploughing lands hard is very discernable, as also of how great consequence it is sometimes to feed meadow-lands for a year or two, thereby to destroy those weeds which are annual by preventing them from seeding.

Sharrock however in his book of vegetation, fo. 141. says, that the plants which annually die, if they are disappointed of running to seed, will continue and survive many years, even till they are permitted to run to seed. — If so, the feeding of meads, and cutting thistles, &c. in order to destroy annual weeds, may not be so effectual as above proposed.

The measures to be taken in the three seasons of the summer for cutting of weeds seems best to be taken

taken when they are fullest of sap, which we may judge of by the stripping of bark, which is most in sap in the breaking out of the bud into a leaf, before the leaf be full grown : and such half-grown leaves, by reason of their fulness of sap, the frost seizes sooner than the others : so that the weeds ought to be cut down when the sap is most in the root, viz. at spring, Midsummer, and Michaelmas's shoot, which is on the full swelling of the bud.

Our farmers say, one need not regard what weeds come up in the summer-fallows, or when one sows wheat; for those weeds and May-weed will all be killed by the winter, but it is the weeds that come up in the spring that do the harm.

Why wet
brings up
weeds and
not corn.

§. 4. If much wet brings up weeds, how comes not the corn also to thrive in wet weather? The reason is, because many weeds are natural to wet ground, such as colt's-foot, docks, thistles, &c. and to cold clay; the wetter therefore the year proves the more such plants will grow to the mastery of the corn: but wet seasons agree with no sort of corn: God having ordered that man should live by the sweat of his brow, has given that general defect to land, as to stand in need of being laid dry by art and tillage. — According to what has been said, lands lying aslope to the north from the sun, will be the more subject to weeds.

Why
wheat
sown dry
becomes
weedy.

§. 5. It is the observation of country-farmers, that, if the season of sowing wheat be dry, it brings many weeds into the corn: — because the seeds of weeds have a moisture in them by lying so long in the ground as easily makes them grow when the ground is made fine for them; whereas the corn, being put into the ground as dry as may be, cannot by that little moisture of the ground grow, and so the weeds first set out ahead of the corn: besides the seeds of many weeds by much wet may burst, as it is in many garden seeds.

§. 6. It

§. 6. It is commonly said, by those who forbear to weed their wheat till it is quite, or almost in ear, that what is trod down or bent will rise again: but I weeded my wheat in the beginning of May, at least three weeks before it was in ear, and on the 23d of May I walked by the sides of the corn, and saw many of the bent and trodden down blades, which it was impossible should rise: I found in the bending of all of them, where they had been broken down, the juices in that bending turned black, and became an iron-mould, which in all probability before harvest might rot them off: I found all such blades mounted upwards from the first joint above the bending, making directly upwards towards the sun, as the young shoots of trees fallen down will do, and the bended head of a pea, as it shoots out of the ground, which rises upright in the blade, making a right angle in the joint; and so it is to be observed that barley blighted by being * more-loose * does, which falling down at the root, the blade in like manner bends inwards at the first joint above the root: undoubtedly therefore such weeding corn when so high does it harm; it would be worth the observing at harvest what ears such corn produce, as also whether the blades trod down to the north and facing the south do not rise more upright to meet the sun, than those trod down towards the south do in rising towards the north, and so from other points of the compass: as we tread down onion, turnip and carrot-tops to strengthen the roots, and to weaken the heads, think you not it does the same to wheat? and consequently the bruising and treading it down must be prejudicial to the corn.

§. 7. There is not always the same reason for weeding corn, though the weeds may be as full set at one time as at another: for sometimes one is sure the ground is in very good heart, and the weeds, by coming up late, are not so; it often happens

Caution not
to weed
corn when
near in ear.
See §. 10.
12.

* Loose at
root.

Some corn,
does not
want weed-
ing like
other corn.

that the corn starves the weeds and overcomes them; but, if the land is poor, so that the corn shall be in danger of falling off, the danger will be of the weeds starving that.

What corn chiefly to be weeded.

§. 8. Special regard ought to be had to the weeding of such corn, which ought not to lie long abroad in the field after it is cut, such as white oats, barley, and wheat; because they will not bear to lie out so long, as that the weeds cut with them may dry without damage; whereas black oats and peas, the first may lie out without damage till the weeds are dry, and peas must, to be dry themselves, lie out so long that the weeds may be dry also: however, it is best to weed oats.

Of weeding a second time.

§. 9. If you know a ground in it's own nature subject to poppies, thistles, morgan, &c. it is good, if the summer prove cold and wet, to look over it a second time, though you had weeded the wheat in the spring; for it is incredible how a second crop of those weeds will flourish in such years, (though they were out of proof at the first early weeding) and keep on growing till harvest, so as to burn the corn and eat out the heart of it.

Not to weed wheat near in ear. See § 6. 12.

§. 10. My wheat was putting out into ear when I sent weeders to weed it, but found at the day's end, that their stooping to pull up the may-weed and red-weed had bent many of the reeds under the ear, for the wheat was tall, and not likely to look up again, it being thick; therefore much of it was trodden down, or rather broke off near the root, the reed being grown stiff: I sent my bailiff and others to view it, and they reported, that the weeders had done a great deal of injury to the corn.—So for the future I hope I shall be wiser, and see my wheat weeded earlier: but, had my wheat been shorter and thinner, and a poor crop, it is probable to such wheat very little damage might have been done: certainly it is best to weed wheat as early in the spring

spring as the weeds are all come up, and, if it must be weeded a second time, ten acres will be weeded in the time of one. I see quick-set plants and garden-stuff thrive so exceedingly the more for being weeded, that I cannot believe but that early weeding the corn will have the same good effect.

§. 11. I asked my bailiff, it having rained the day before, why he did not go to thistling my barley; he said, by no means, he should do more harm than good, whilst the top of the earth was clammy; for it would clod to their shoes, and in treading on such barley as was shallow-mored it would stick to their shoes, and they should pull it up after them, as well as tread other ears into the ground which would never rise again.

§. 12. I began weeding my barley early this year (anno 1703) and my oats sooner by a fortnight than others thought of it: I had about ten weederers in my corn, and yet found by the latter end of the weeding-season, by the damage they began to do in treading down the corn, that I had great reason to rejoice for so doing: I had my weederers all ready against hay-making-time, which was then at hand: but when I had done weeding, the farmers had scarce begun, rain coming and preventing them, as they had missed making use of the season when they might: he that thinks he shall have a good crop of any sort of corn, had best weed it early, because his corn, running thick and gross, will receive the more damage by late weeding.

Weeds cut late, when gross, and the barley gross, it is likely the corn must have been much kept down by the weeds falling on it, so that it can never rise again.

§. 13. " Mr. Ray speaks of wild oats as a weed of wild difficult oats.

* Inter segetes nimis frequens est, nec agri, qui ea semel infecti sunt, facile hac peste liberantur; etenim ante messim matrescens,

difficult to be got rid of; for ripening before harvest and shedding its seed in the ground, it will remain there till the ground be ploughed up again; though it be for a whole year, and then come up with the corn.

The Isle of Wight is extremely apt to run to wild oats, which major Urry says, will lie four or five years in the ground, and come up when it is ploughed; his way to kill them is, to lay the ground down to clover, and to mow the oats and clover together before the oats are ripe, and their roots will never grow again.

Of furze. §. 14. Mr. Cary's woodman walking with me upon Winterhay's farm in Dorsetshire, I observed the grounds to be much over-run with furze; he said, they were the worst sort of furze, they were French furze, which run up higher than the English furze does, but would not be so easily killed with chalk, nor were they tender enough for the cattle to eat them: they begin to blow in the middle of January, and last all the summer; the English furze begin to blow the latter part of the spring, and hold it all the summer. — I could see little difference between them, only the English was of a clover thicker prickles, and the smaller prickles tenderer.

Of fern. §. 15. Mr. Ray, speaking of the fern, says, it is killed by cutting it two years together.

The destruction and killing of fern by cutting it seems to me to depend on the judicious time of doing it, viz. at the three proper seasons; the spring, Midsummer, and Michaelmas, when and just after the respective buds are shot forth, to which nature has designed the current of the sap, which having no vent, must cause a plethora at the root and body

turefcens, semen in terram effundit, quod per hyemem ibidem reptans, aut per integrum annum, si fatio intermittatur, cum segete de novo succrescit, fo. 145 f.

of the plant, and turn to corruption ; for the sap must break all the capillaries, of which there are a multitude.

§. 16. Taking a view of my corn about three weeks after it had been thistled, I could not find ^{Of thistling.} that any of the stems of the thistles, which had been cut off, shot upwards since the thistling-hook had taken hold of them, nor did they anywise tillow out or shoot up suckers ; but I found three or four of the serpentine leaves to every thistle (which crept so low it was impossible the hook should take hold of them) to have spread themselves out pretty largely, yet not so considerably as might have been expected, the sap feeding them plentifully ; nor could I find the roots of those thistles, which had been cut off, thrive beyond their fellows afterwards : it may be worth the enquiry whether those lower creeping leaves would not rise much higher, if one had patience to stay, so as the hook might cut below them ; but the best way of all, both for dispatch and profit, I conclude to be, to draw the thistle before it be grown to that bigness that they usually cut them, and when the ground is reasonably moist : when they are pretty big they will easily draw by the thumb and two fingers, but false fingers of hard leather may easily be had.

About a month after I had thistled oats and barley, I observed the barley-ground to be full of thistles again, whereof many stood so near to the old stems, viz. within six inches, that I supposed they had tillowed from them ; therefore I dug down carefully half a foot in the ground, but could not find the roots of the young thistles inclined towards the old stem : I tore up the young thistles with roots of nine inches long, broken off and very taper and slender at bottom, with small fibres belonging to them, as other maiden-thistles had : nor is it to be conceived that nature, which is ordered to go the nearest way,

should from the slenderest and lowest part of the old root send forth it's sucker, but from the upper part and strongest of the whole root, nearest to the surface; so I observed some small tillows or issues from the old stem, which did not advance to any great height; they issued out between earth and air, and, as if maintained by the old stem, they carried a shrivelled dwarfish look with them: they issued out more freely and longer here than in the white soil though thistled a fortnight before this ground; for either the stems here carried no suckers, or very dwindling ones: therefore there is less danger of the thistles growing again by tillowing in thistling white land early than stiff clay; nor did the under-leaves of the old stems shoot out to any length in the white ground in comparison to what they did in the clay: the wet year was the occasion of these tillows.

August 24th (anno 1711) I dragged a nine-acre piece of wheat, sowed on one earth, which was very thick, and full of thistles that had tillowed out from old stems, which I had cut about a month or six weeks before, lest they should run to seed, I was a little apprehensive, though I knew the thistle to be but an annual plant, whether the tillowing thistles from the old roots might not strike fresh roots to the great prejudice of my wheat; there were also many thistles which were seedlings.— November 17th I visited my wheat, and though the forehand of the winter-season had been very mild, yet I found all the thistles dead and rotten in the roots: it may be the drags battering them might hasten the effect, but I believe they had been dead some time before.

If wheat be not well thistled, the reapers take up the grips so tenderly, lest they should prick their hands, that by their loose handling them many ears are left behind, and such foul work is made, that the wheat left behind might sow the ground.

Though

Though barley and oats should both be thiftled, yet, if it is impracticable to accomplish both, the oats should be left unthiftled rather than the barley, not only because the oat-straw is generally less proper for fodder than the barley-straw, but also because oats may lie longer in swarth and in cock than the barley, and so the thistles may have a reasonable time for drying: it is further also to be noted in thiftling spring-corn, that, if the thistles be once grown tall, strong, and prickly, as they commonly are before the barley be out in ear, and about five weeks before it is cut, then I think, though the barley be not so high, nor thick, as to take harm in thiftling by treading, yet the thiftling in such case does more harm than good; first, because the thistles being grown so sticky will not thoroughly wither, nor shrink and waste away, as it were to nothing, by harvest, but will be raked up with the corn; secondly, by harvest such great thistles will turn black, and spoil the fodder (being raked up with the swarths) a great deal more than if they had stood till harvest; for then, being cut green with the corn, they will hold a good colour, and drying they will eat tolerably well, nor will the cattle refuse them in the straw. Chalking land is an excellent way to destroy the thistles.

It need not be wondered at, that in borders, alleys, grass-plots, gravel-walks, &c. weeds, grasses, and trumpery should so increase as they do, if we observe that such weeds and grasses, however low they seem to be kept, run to seed when they are so small as to escape our observation, and before they seem to be worth weeding up.

I was weeding my barley (anno 1701) so long before it was in ear that one could not know it from oats; the thistles were then pretty high and strong: but a farmer in my neighbourhood said, he never

weeded so early, because the thistles would grow up again. — Upon which, I talked with all the woodmen, and with other husbandmen, and I found by them plainly, that, notwithstanding what the farmer had said, it was good husbandry to thistle as I did; for otherwise the thistles would grow so big as to eat up the heart of the corn, which it would not recover; and though the thistles might grow again, yet they would not seed nor be rank, but still be over-top and kept under by the corn; whereas by going into corn when in ear damage was done, and then the thistles were so big, that being cut down they would fall on the barley, and sink it down, so that it might some of it never rise again, and that more especially, if they cut down the thistles in rainy weather; for thereby they would be gross and heavy, and not apt to wither so soon as otherwise it would do, and so the corn might be in danger of being ever held under; but when the corn was as young as mine, thistling when wet did it no harm: and, if by thistling so early you were forced to thistle again, it was no more than the best husbandmen often do.

This day, being June 25th, (anno 1703) I conceived a fancy for reasons before hinted at, that a better method might be found out for destroying of thistles than cutting them; so I went into a ground with a pair of tongs (which also might be improved) and with them I took hold of the lower stem of the thistle, and drew it up with all it's roots nine inches in length, the stems of the thistles being nine inches or a foot long, and that with greater expedition by much than the labourer could cut them, as he, being eye-witness of it, was satisfied. This instrument may not, it is possible, do so well in wheats, because the ground may be too hard to draw the root; the practice must only be in barley, where the ground is loose: if the ground be somewhat moist, it will be the better.

It is good to thistle broad-clover, and to cut out the docks, and scabius's, &c. as well as corn, for thereby the broad-clover (I know it by experience) may be made a day the sooner.

§. 17. All this spring (anno 1708) being wet, ^{Of char-} and lands being generally obliged to be sowed wet, ^{lock, and} it was observed there was an infinite quantity of char- ^{how} lock in cold red clays, both peas and barley-land; ^{known} but in white or lighter land the charlock did not so ^{from} much over-run it: therefore it seems one should avoid ploughing and sowing cold clays wet, if only on the account of charlock; the reason for this seems to be, because charlock-seed is very oily and hot in taste, as has been before noted, and therefore resists putrefaction, and consequently the fibres of the seed are not easily opened, and loosened, nor penetrated by a great deal of moisture; whereas white and light earth is soon dry after rain, and so the water does not continue long enough on it to set such seed on growing: therefore cold wet lands are always more subject to charlock than white land. — In this the turnip-seed is of a direct contrary nature to charlock-seed, which latter to the taste conveys in a very apparent manner a much tarter, stronger oil; for though the turnip-seed requires a speedy shower of rain to bring it up, yet much rain, when it is first sown, makes it drunk, and it's parts being loose and uncompact imbibe the rain so freely, that if they continue in it they are converted to mucilage: I have often sowed charlock-seed and turnip-seed in flower-pots at the same time, and watered them, and found that whereas turnip-seed will shew itself in three days, charlock would not appear under ten days; the seed-leaves and roots of the last are much hotter and more peppery than the plant of turnip; therefore none who sow turnip-seed need be at a loss on the first appearance of the plant, to know whether it

it be turnip or charlock ; for, if the seed-leaves appear within a week's time, it cannot be charlock ; again, if leaf or root tastes hot, it cannot be turnip, which tastes mild ; the advantage of knowing which is, that one may lose no opportunity to sow turnip-seed again in a very few days, and consequently lose not the season, if it comes not up, which by the aforesaid signs one may know ; whereas, if one must learn the difference from the leaves they put out after the seed-leaves, that must take up at least three weeks, and thereby the season of sowing again may be lost ; for if we have not showers or moisture for the sowing of turnips, it will be to little purpose.

On observation past on my corn of all sorts June 8th (anno 1715) my wheat, which was sown on one earth, worked very fine and pretty dry, i. e. a little drier than we commonly desire it to do for wheat, and which was sown pretty early, ran very much to charlock : I also observed that my blue peas which were sowed in March, and the ground ploughed fine and dry, brought up abundance of charlock : whereas the wheat-ground which ploughed up as heavy, and wet, and as cold as we commonly desire it, and the grey partridge-peas, which were sown from the beginning of February to the 20th, when the ground and weather were colder, produced very little or no charlock : all this seems to depend on one and the same reason in relation to the sowing, whether at spring or autumn ; viz. the charlock-seed being close in it's tubes and vessels, and full of oily parts, which resist putrefaction, as aforesaid, the juices of the earth (whilst cold and wet, and the season so also) could not insinuate into the charlock-seed, it not being attenuated enough by heat : whereas, when the season of the autumn and spring, and the ground was warmer, and turned up very fine, the juices easily

ly penetrated the vessels of the charlock-seed, and set them on growing; that afterwards, when both the weather, and the ground grew warmer, the charlock-seed did grow up, is not to be wondered at, since the good disposition of the bed seeds are at first committed to is of the greatest moment, and the earth soon settles, and hardens, and falls close, and becomes unfit to make the seeds grow.

This spring (anno 1701) I sowed goar-vetches on a stale fallow of a head-land, and sowed another piece of goar-vetches the same year on a second stale earth of a month turned up; at the same time we gave a second earth for barley; and I had nothing but charlock on the latter, and nothing but thistles came up in the former; from whence I collect, that harrowing on a stale spring-fallow tends to nothing but producing such weeds the ground is inclined to: therefore I had better have given another earth upon the sowing of my vetches, which would have buried the charlock that had took root, which the harrows alone could not do.

I winter-fallowed two grounds (anno 1702) when in very good temper and dry: the latter end of February or beginning of March I ploughed one again and sowed it with peas, the ground working dry: I likewise ploughed the other again, and sowed it to peas and goar-vetches at the same time; in both these grounds, and all over them, came up abundance of charlock, so that they were perfect yellow with it; only about two acres of the latter was reserved till the latter end of April, and then had a second earth, and was sown to more goar-vetches; but then rain had fallen and the ground worked pretty lumpish, and therein I had not a stem of charlock came up.

We had a very showery wet spring all March, Id. and of April, and May, and the first week of June, and ^{thistles.} my lands being in very good tillage, worked exceeding

ing fine at sowing-time for peas, oats and barley, as also had my wheat-land and vetches, and I never knew fewer thistles in all sorts of my corn, but there was abundance of charlock, which I have often observed to be the consequence of land's working fine and dry. Charlock therefore is more the produce of poor ground, because that generally works finer and drier than that which is strong; but thistles are more commonly the produce of strong land, because that generally works colder, wetter, and rougher, which properties bring thistles; consequently, in those years, wherein the ground works worst, the thistles come up thickest. Perhaps the reason of this may be, because the seed of the thistle may have taken root before the spring-corn is sown, and, when the ground works rough, it may not be torn from many clods of earth, and so dies not, but abundance of the roots, having a fastening to the earth, still live; whereas, when the ground works fine, the roots of the young tender thistles may be torn away from the earth, and so wither and die; and that this may be the reason I am apter to believe, because, when ground works rough, a crop of thistles soon appears, and tops the corn, which could not be, except the thistles had had some rooting before the ploughing for sowing; for where the ground ploughs fine, as the thistles are few, the corn tops them, till it leans down it's head before the harvest, and then the thistles, which were not weeded up, may shew their heads above the corn; and in this case the thistles are generally weak, as having no root but what might grow from the seed after the corn was sown; for, as was said before, where the ground works fine, what tender young thistles had taken root, which are the thistles supposed most to annoy corn, are, by the fine working of the ground, conceived to be torn up by the roots; thus the fine tillage

tillage of the ground prepares a bed for the seeds of weeds; but tears up root and branch those weeds, which had before taken root, which generally speaking, are the most hurtful weeds; fine tillage of the ground therefore, in the general, is a quality of good husbandry.

What may be the cause of producing charlock I cannot tell; but it seems, it must be either the sowing ground early, or dry; for that part sown late and wet had none: nor did my barley that year sowed late and almost in the dust, produce but very little charlock: but after sowing the barley in April and May, there was no rain for a long time, yet the barley came up well, but the charlock came up very thin. — From hence I cannot but conclude, that, though a dry summer, and a dry winter-fallowing tends much to the killing of the weeds, which arise from roots or fibres, as also from seeds, by laying open the ground to the frosts in winter, and to the scorching heat of the sun in summer; yet that, when such earth comes to be sown either to winter or summer-corn, the finer and drier it works, and the better for bringing up the corn, the better and kindlier in proportion for the seed of weeds, by reason the seeds of weeds are of less pith than the corn, consequently more apt to be choaked when the ground works stiff: but when it works well for the corn, it does so also to bring up the weeds, which arise from seeds, or for the bringing up such weeds as arise naturally from the ground, the body of the ground being more opened to the sun and rain's visiting all it's pores and impregnating it: for I cannot see why earth best prepared to bring up the seed-corn, is not also best prepared to bring up the seeds of weeds, and such weeds as are natural to the ground. But the seasonable winter and summer-fallowing, as before hinted, may reasonably prevent and cut off such weeds as arise from roots or fibres.

And

—And to such weeds as arise by roots or fibres of roots, the drier and dustier corn is laid into the ground, the more must such roots be separated from the earth, and be exposed to wither by the heat of the sun : but, as was said before, I think it holds quite contrary in weeds arising from seed, and that the good disposition and mellowness of the ground is fittest to produce weeds either from seed or naturally ; the garden-mold being so fine, is for the same reason so subject to weeds. . I see quick-set plants and garden-stuff thrive so exceedingly the more for being weeded, that I cannot but believe early weeding the corn will do the same good to the ground ; and this may appear from mellow earth flung up in digging a pond or other hole, which earth is generally of a mellow, hollow sort, whereon thistles, and other weeds will grow abundantly, whether they come up naturally or by seeds sown ; this seems to shew how much fitter the better tempered mold is for weeds as well as for seed-corn : but when a mere and perfect strong clay is flung out in a heap in digging such a pond or hole as aforesaid, then, as I have observed, such mere clay has produced no weeds, the earth wanting that hollowness and fit mellowness, till by lying two or three years the upper crust is hollowed by the sun, or by the treading both of men and cattle.

Of couch-grass.

§. 18. Mr. Raymond says, the most destructive grass to corn is the knot or couch-grass, it being of that increasing nature, that, if but a piece of a root were left, it would in one season spread over a patch of ground as big as a small catting-net.

Of great and small bind-weed or with-wind.

§. 19. Mr. Ray speaking of great bindweed, says, it is frequent in hedges in watery places, it's root is perennial, but it's stalk annual ; I suppose the small bindweed is of the same nature, as to the soil it desires, and the perennial root it carries ; it grows

grows in my clay-land, to the corn's great prejudice: therefore land may be presumed cold that runs to it, and must be treated accordingly; I am apt to believe it propagates itself by seeding in pasture-ground, for it seems to flower too late, in corn, to seed before the corn is cut.

In both barley and wheat, in the deep rich land, near Ilfley, in Oxfordshire, I observed, withwind with mighty grossness climbed up most of the halm to the top, no doubt, but to the prejudice of the corn in many respects, which must be eat up before harvest.

I have known withwind or bindweed multiplied and propagated both in barley and wheat, where the land has been strong, and therefore more subject to that weed; for, when such ground has been ploughed for some crops, to peas, barley, or oats, for which corn the land is only ploughed in the winter months, or for winter-vetches, for which end it is not tilled till about September, there is no killing thereby the roots or seeds of weeds as by the summer-fallows for wheat, but the weeds, which multiply from the off-sets or joints of roots, or from seeds, do increase thereby; in such case I have known clay-land folded for barley (and particularly that part of the ground, which waiting for the folds going over at last was latest fallowed) bring up a great increase of withwind, though the spring and summer has been very dry, inasmuch that every blade of barley had a withwind round it; that, as the fold has brought up a crop of barley, it has, with it, to every blade of corn brought up it's enemy to eat it out, and pull it down before it is ripe, and prevent the filling of the grain, whereby the crop of barley is greatly hazarded after it is cut also, by the danger it must run by laying in swarth till that weed is withered, before it can be carted.—Again, near
the

the end of the first summer, after the first year of a hop-clover-crop, which I fed, that is, about the beginning of August, I fallowed a ground for wheat, and then dunged the fallows, and sowed my wheat before Michaelmas: I had a very good crop of wheat, but a withwind came up to every blade, so that, had it been a wet and cold summer (whereas it was a hot and dry one) my wheat had been pulled down and lodged while green in the ear, and in the milk, and then could not have filled in body and flour, and so had been of the nature of blighted corn: the increase of this withwind was, without doubt, occasioned by the laying down this ground only to one summer-feed after the hop-clover was sown, when the ground had born three or four crops of summer-corn after it's wheat crop, whereby, by the winter ploughings, as I intimated before, the off-sets of the roots of weeds, and their seeds were propagated; and I could not properly by a seasonable summer-fallow destroy these roots or seeds, by giving the ground a summer-fallow the beginning of June; for then I had lost the fruits of my hop-clover crop by ploughing it in at the beginning of the first summer, which would have contributed much to the killing of the withwind; and by delaying the fallowing three months longer, viz. to the beginning of August, the sun had both so lost it's strength to burn up the roots, and malt the seed, and the ground the opportunity of lying long to a fallow, that the dung laid on the fallows gave new life to the roots and seeds, which was very apparent by this one experiment: there had been a great deal of hop-clover seed shed that year, because I could not feed the hop-clover down low enough (I had so great a burthen on the ground) and this shattered seed being on the beginning of August fallowed in, laid under the fallows alive till about the 10th of September, when I turned up the ground again

again, for sowing wheat; then the hop-clover seed was turned up again, and grew mightily by virtue of the dung, and at harvest produced, with my wheat, a fine crop of clover, that I thought it would better pay the feeding it a year, than to proceed on in the usual course of husbandry, viz. to winter-fallow after wheat, for peas, oats, &c.

§. 20. Every one agrees the lighter one makes ground subject to red-weed, and may-weed, by giving it more earths, the more of those weeds it will bring, and those are some of the worst weeds in corn, for I have known as good a crop of wheat as one would desire all the winter-time, and by those two weeds coming up in the spring and summer, it has been eaten out so, that there has not been the seed.

I find all agree, that in weeding the morgan or may-weed, and the red-weed, they should be drawn up by the root rather than cut up with the hook; because they have a slender tap-root, which draws easily, without loosening the ground, and mores of the corn, whereas, if they be cut, they will tillow and come again; but the thistle has too great a root to be drawn, and when cut comes not again.

Seeing poppy requires a winter and summer for growing, to make it's seeds grow, in order to fallow them up the summer after, and destroy them, it seems the summer-fallowing the year before, or the October before, is much conducing towards a wheaten crop.

The poppy is a winter and not a summer weed, the seed requiring to have root very early in the spring; therefore I never could observe it grow in barley or oats, unless it was barley and oats sowed on one earth, which is very early sown: the rooted seed, possibly, in such case, being not pulled up by the harrows, grows, tho' in very little quantity.

It is usually observed, that the white land in our hill-country is very subject to poppy, if ploughed

with two or three earths, and made thereby light, but clay-lands are not so subject to be reduced: — the reason of which seems to be this; because the poppy-seed is a most small seed (for Mr. Ray computes many thousands to lie in a pod) which seed, by reason of it's smallness, is easily buried in clay-land, and less able to shoot it's seed-leaves through, because it sooner settles and binds than light land, through which it's seed-leaves easily pass; it is very likely therefore, the evil of red-weed being so great, it may be better to sow white land on one earth.

The poppy is much hardier than the wheat, for that blossomed exceeding thick in the grounds where the wheat was almost all killed, exposed to the cold winds of this winter 1709.

It is very plain that braishier shallower ground in the hill-country is very subject to red-weed or poppy, and the strong clay-ground not so; therefore, wherever in a clayey piece of ground there is a sinking or fall, or the grete runs shallower (as in some places of most of my clay-fields it does) as also in the lighter fields, there I ought to give the weeders stricter orders to be cautious and circumspect to pull the poppy-weed up: — but, as to the strong deep clay-land, even the poppy, though it does appear there thick, need not be much regarded; for it will there every day dwindle, and the cold clay will starve it; whereas, on the contrary, what poppy appears in spring in the light shallow stone-braishy land, though the root and stalk seems poor, will spring forward, and thrive apace all the summer till it blows and seeds.

When the farmer says, red-weed, morgan, &c. burns up corn, it is only meant that, when that gets ahead, it sucks up the moisture from the corn, and then indeed it's lamentable effects are as if the corn was scorched up.

§. 21. Being with farmer Lake of Faccomb, we fell into discourse on husbandry, and I told him I was gathering the cockle in the field out of the winter-vetches, lest I should bring them into the dung of the back-side : he said, he saw not how that profited much, unless I designed them for seed, and then it might be inconvenient, but, if they were for horses meat, if the cockle with the vetches came into the dung, it would be heated thereby, and never grow again ; the same he said of charlock : I asked him then if he never thought abundance of trumpery was carried into the field with the dung, which grew again ; he said it was so in case green new dung was carried forth, but in case the dung was first flung up in heaps to rot, the seeds in it of weeds did not grow : he said, if his feed-wheat was clean, he never observed he had cockle. Cockle.

§. 22. Mr. Ray says of the corn-marygold, it has a woody root, and strikes deep, therefore must eat out the heart of the ground, and must be a great harm to corn ; if it's seed ploughed-in will grow, as the garden-marygold will being dug in, it is hard to overcome the increase of it. Corn ma-rygold.

§. 23. Farmer Biggs told me, that a field of his was all over-run with colts-foot, and that he sowed it to vetches, and that those vetches britted or scattered, so that he put in his pigs to fatten in it, which nussled about as much as they thought good, whereby, as he thinks, they trod and nussled in many of the vetches, for they came up very thick, and he preserved them, and had a very good second crop ; which two years crop of vetches killed almost all the colts-foot, so that there has been but little there since. Colts-foot.

Colts-foot is seldom known to grow in the common arable fields, for the sheep fare so hard there, that they eat up all the roots on the fallows, but, unless one was to bring such sheep on our fallows, they

will not be eaten, for our sheep will not destroy them.

The reason why laying a ground down long to grafs is said to kill the colts-foot and other perennial weeds, is, I suppose, because the roots of the natural grafs matting more and more every year, do in four or five years time so fill the ground and fasten it, that the colts-foot cannot come through at spring, they may also happily so bind the surface of the earth together, as to hinder the root from that communication with the air at other times as all plants may require; to hasten therefore the destruction of colts-foot, I apprehend that plat of the ground, where it abounds, should be laid down to rye-grafs, to continue so till it is destroyed; though the other part of the ground be sowed to clover, and ploughed up again, yet the colts-foot should continue lay, and be dunged well, and mowed, and sowed very thick to rye-grafs; these means may effectually destroy the colts-foot, as it is manifest dunging land does destroy clover and French-grafs.

I this day (July the 3d) ploughed up broad-clover, and turned up the roots of colts-foot. I observed between earth and air many little buds shot forth of the bigness of the Midsummer buds in fruit-trees (in all probability to be the ensuing leaves or flowers of the next year) from the root; at five, six, or seven inches depth I observed here and there a shoot, of a callous body, like the root, one, two, three, or four inches long. Whether the first or second sort of shoots were to be leaves or flowers of the next spring will be fit to be enquired into at spring, but what is to be observed, is, that in my fallow I turned up the colts-foot roots of a foot long; therefore in a winter-fallow I had undoubtedly turned up the same roots, at least of the same length, and one would think to better effect, nature being to begin again

all the progress she had been going on till that time ; but it is manifest a summer-fallow is of much greater consequence to destroy the colts-foot, than a winter : how comes this then to pass ? the only reason I can give is, that the nature of colts-foot is to thrive and improve in cold wet ground ; the winter-fallow therefore does not destroy these roots, which are ploughed up, but they live still by reason of the coldness of the ground at that season, and strike fresh roots ; whereas the colts-foot lies so dry in the summer-fallows, turned up to the sun, as to die, nothing being more contrary to their nature than a healthy dry soil. — This ground being ploughed dry, and a rain following, whereby the ground was mellowed, I found these roots easy to be pulled up, at a considerable length, with their soboles or bud of the next year, above taken notice of ; from which I do infer, that in hiring people to pull up such colts-foot roots, if a remainder does break off, and is left behind, which may grow, yet for the next year it cannot, because, the soboles being lost, it is too late in the year to provide another ; and though it may be thought that such roots as are turned up in a summer-fallow will wither of themselves, yet it is to be considered, that such soboles as are buried, if the season be wet, will spring again.

Being at Oxford, I visited Mr. Bobart of the physick-garden, and I told him of the method I took to destroy the colts-foot : he said, if I cut the colts-foot often in a summer, or whipped it, it would, he believed, kill it ; I said I had so heard of fern ; he agreed it to be true, and said all plants were easily killed by keeping them under ground in that manner.

§. 24. Common ragwort, Mr. Ray says, grows Ragwort. in pastures and lay-grounds, and about path-ways ; the root dies ; therefore it propagates by seed, and is to be extirpated before it seeds, by cutting it up.

Hoary perennial ragwort, Mr. Ray says, has a perennial root, and throws out new soboles, or buds, at autumn : if so, different methods are to be taken with it to extirpate it.

Nettle.

§. 25. Mr. Ray tells us, that the common stinging nettle is of a lasting nature, ——— but the lesser stinging nettle is annual.

Dyer's-weed.

§. 26. Dyer's-weed makes the milk of the cows that feed on it bitter, as it also does the butter and cheese made of it.

Mullen.

§. 27. Ray and other herbalists say, that mullen grows on cliffs and banks, and say nothing of it's growing in warm sunny fields, which it does at Crux-Easton, particularly in one of my fields, where not above thirty roots of it came up in a scattering manner at first, which seeded, and the winds blew it about the ground, and the next year came up thousands ; but I observed those that seeded the year before died, and therefore that it is a weed easily destroyed by cutting off the stem when it is in flower, and preventing it's increase by thousands.

Groundsel
good
against the
worms.

§. 28. Groundsel and savine are good against the worms, commonly called the bots in horses.

Pilewort.

§. 29. In our meads at Easton, on our hills, and hedges, and lanes, we have great plenty of pilewort growing, which is one argument, that such of our lands are moist and strong where it grows.

Spurge.

§. 30. I find by Mr. Ray, fol. 868 and 869, that both the tithymalli or corn-spurges, which grow up in corn fields, are but annual.

Spurry.

§. 31. In the common corn-fields, about Lutterworth, inclinable to a heavy fat sand, I observed spurry to grow wild very plentifully ; I gathered of it, and shewed it to Mr. Bobart of Oxford ; we both wondered so contemptible a plant should be sown in the Low Countries, where Mr. Worlidge, fol. 31. says, they sow it twice a year ; once in

May,

May, to be in flower in June and July, and the second time after rye-harvest is in, to serve their cattle in November and December; he says, hens will eat the herb greedily, and it makes them lay eggs the faster.

§. 32. The knapweed, or matfellow, is chiefly ^{Knapweed, scabius, &c.} natural to corn-land, in a gravelly soil, and is of a perennial root, as Mr. Ray observes: devil's-bit is also perennial in it's root; it is probable blue-bottles are the same, and all of the scabius sort, seeing they emit new soboles every summer at the root for the fruit of the next year, and seem not to seed early enough, before the corn is cut, to propagate themselves in corn-lands by seed, in which ground they most abound.

It seems plain to me that both knapweed, scabius, and spatling-poppy roots are perennial, as also millefoyle (which infests some pastures) by the many buds or soboles they emit at their roots at this time of year.

§. 33. It's seed ripens very soon, and as soon ^{Yellow} sheds, after which it dies away root and all before ^{rattle grass.} hay-harvest: the ready way to destroy it is to well-dung the meadows.

§. 34. Eye-bright flourishes chiefly in upland ^{Eye-bright.} barren pasture ground.

§. 35. Mr Ray says, lady's finger grows for the ^{Lady's} most part, in dry, chalky, or gravelly soils, and ^{finger.} in all barren ground.

§. 36. Yellow lady's bed-straw, or cheeserening, ^{Yellow} over-runs almost two of my meads, which have ^{lady's} been mowed and not well supported with manure; ^{bed-straw.} but my other meads, parted only by a hedge, the soil and situation the same, being fed for two years have very little of it; it grows chiefly in warm places, and in dry pastures, and on hillocks, and balks.

balks.—Therefore where this grows you may conclude your meadows want soil to fatten them.

Silver-weed, or wild ransey.

§. 37. Mr. Ray says, the root of wild ransey is good to eat, and somewhat of the parsnip kind, and that hogs are very fond of it.

Common chickweed.

§. 38. On the 23d of October I observed a great deal of chickweed, the branches of which carried many buds in order to blossom, many full blossoms, many seed-pods with white seeds almost ripe, and many pods with red seeds full and kindly ripe; so it seems it is in the nature of this plant to be always feeding, and so the less fence against it by any sort of husbandry.

Crow foot, or ranunculus.

§. 39. There are several ranunculus's common in our meadows, which, when green, blister the flesh; these are not touched by cattle, but left standing in the fields, and yet, as I am told, are fed on greedily by all sorts of cattle, when only dried into hay: Dr. Sloan mentions this to account for the cassavis root, which, being strong poison, by being baked is wholesome bread. fol. 25.

Red-rot, or flower-sun dew.

§. 40. Red-rot (or flower-sun-dew) is said to take the name of red-rot from it's being so pernicious to sheep.

Ground-ivy.

§. 41. I observed abundance of ground-ivy trailing on the ground, and, in gathering it up, I found the trailing joints, being in abundance, had struck fresh roots, from whence new leaves came up, as in strawberries.

Mallows.

§. 42. Mr. Bissy of Wiltshire had abundance of mallows that came up in a broad-clover ground, so as to overshadow the broad-clover; he was satisfied mallow was in the clover-feed, because his brother sowed the same seed, and had the same increase of mallows; Bissy says, every bit of the root of a mallow will grow. Note, this 23d of October I observed plentiful soboles or spring-issues from the old roots.

§. 43. Cicuta

§. 43. *Cicutaria tenui folio*, or fool's parsley, <sup>Fool's
parsley.</sup> which grows in rich land, and in grounds that are cultivated, is an annual, and therefore may be destroyed before it has seeded.

§. 44. In Sheephead and Hawthorn fields in Leicestershire, I observed some ridges so pestered <sup>Hare's-
foot trefoil.</sup> with hare's-foot trefoil growing amongst the corn, that it seemed as bad a weed in the corn as any I had seen that year; both grounds seemed to be of a clayey sand.

§. 45. Being at Mr. Raymond's, he assured me, <sup>Cow-
garlick.</sup> that cow-garlick was a great whore in corn, a little way from his place in the dry sandy grounds; and yet it is no whore to them who sow it in the clays; for there it will not grow; but in his neighbourhood it comes up in the corn in great abundance; Stevens of Poteroy says, it grows in some places in such abundance, that the wheat tastes strong of it, and is thereby damaged 6d. and 12d. in the bushel.

§. 46. As rye-grass and natural grass eat out the ^{Moss.} clovers, so I observe in the third year of rye-grass moss begins to grow on the land, and eat out the rye-grass and natural grass, and is the great impoverisher of meadows; it is very probable it's seeds are carried to far distant grounds, being so imperceptible (as Mr. Ray makes it) to the eye: it is very probable also, it, being so small, is buried in arable, which may be the reason it comes not up but in land lying to rest, where the seed cannot be covered or bound; it is possible also it comes not up in arable with the corn, because (as many seeds do) it may not grow under two, three, or four years time; Mr. Ray observes; they are apt to grow either in too cold lands, or too scorched-up lands: he says, on house-tops they seldom increase on the south side of the tiling, as on the easterly exposition, and northerly, which the sun goes off from by times, and on which the first dews of the night

night fall; from whence it may be concluded, land is so much the more or less liable to it as it faces those expositions: but seeing it is so great an enemy to meadow, and other grasses, the nature of it ought well to be observed, and it's seeds planted in pots to see their nature, and thereby one may know how to destroy it: — our experience seems to agree with what Mr. Ray says as to it's inclination to thrive in cold land, it being manifest that, when such cold clay is rectified by ashes or lime, or as he says, ^bashes of which lye has been made; which he advises to be laid on the ground in the month of March, the moss forsakes the ground for some time.

It is no such great wonder that mosses should grow on stones and walls, if we consider how many thousand times less their seeds are than the seeds of most herbs, whereby they have as fit a matrix to cover themselves in, in the crevices of the stones, where usually dust gathers, and are as well buried, in proportion to their bodies, as the seeds of other plants are in earth-mold; nor are we more to wonder, that the mosses from the said seed should thrive and flourish as well as their seeds germinate, if we consider how their bodies drink not only the dews, but are fitted, by the innumerable angles their branches and close-knit fibres make, to be a long receptacle of water, and at the same time to break all the rays of the sun, and how fit for gathering the dust to their roots, as by experience may be seen.

Why dung
and ashes
kill moss.

§. 47. That dung, ashes, &c. should kill moss, is, I suppose, from this reason; because the moss having a most wonderful small root, which grows only to the ground by adhesion, is easily suffocated with too much goodness of the dung, and overcome
by

^b Muscus, qui hortos & prata humida obsidet, ita ut gramen suppressat, Martio mense cinere aboletur, sed eo quo fiximum fuerit confectum. Ray, Hist. Plant. fol. 122.

WATER and WATERING. 315

by the strong penetrating quality of the ashes, as being no ways qualified by rain on the surface of the ground. For these reasons the most diminutive plants will not grow on rich ground, such as rue, whitlow-grass, moss, and a great many more, because they, being very small, and of slow growth, are easily over-charged with a plethory, from whence the fibres of the plant, nay even of it's very seeds whilst in the ground, must burst.

WATER and WATERING.

§. 1. **I**T is but of little purpose to depend on a pond's holding, because it is dug in a strong clay, if there be no great shade, over it; for the sun and frost will quickly open it, and the water will run away; but such pond must be made with four square slopes, and covered with gravel, or a mortar-earth, four or five inches on the tops, which, cattle treading in, will cement with clay, and bind, and will not crack with the sun and frost; but nothing suffers more by either than mere clay.

§. 2. I begin to suspect (in my hill-country farm, where I have no ponds but what are pitched, and where I have my backside-pond and the street-pond, which both must necessarily be sometimes stained with dung) that, of your great cattle especially, it is of consequence to buy those that have been bred in the hill-countries, where they have been used to want water more than they will with me, and have been used to drink our pond and cistern water; for I find cattle that have been used to spring or river water, do drink very sparingly of our water; and then I am sure they cannot thrive or fat well.

§. 3 Foul water, as Grew observes, will breed the pip in hens, and nastiness, lice and scabs in kine; Foul water
pernicious
to cattle,
and
&c.

and all creatures, swine themselves, which love dirt, yet thrive best when kept clean.

Watering
cattle.

§. 4. Farmer Ekton, late of Crux-Easton, extolled the convenience of the pond I made in my field to a high degree; he said, that by means of that pond I need not fear the driest year, for, if I had no grass and did put a hay-reek in the field, my sheep would be all the summer mutton, when others would be carrion.

Farmer Collins (in the Isle of Wight) was speaking of the great necessity of having convenient water for cattle at all times, both for their health and increase of their milk, and how insufficient it was for cattle to be drove to water but twice a day, whereas the cattle would possibly drink five times a day: and he said, that hard weather came one winter when he had lambs, and was forced to fodder his ewes with hay, and the water where they drank was frozen hard over; three or four lambs of a day died away, and the ewes had not milk for them; at last he bethought him to break the ice of the pond, which when he had done the sheep came to the water with great eagerness, and went in above their bellies and drank, and no more lambs died.

Water
proper for
watering
plants.

§. 5. Worlidge, fo. 248. speaking of different waters, says, it is a very great injury to most tender plants, to be diluted with cold water from the well or spring; it checks their growth exceedingly, as may be seen by a bleeding vine, to the naked roots of which if you pour store of spring or cold water, it suddenly checks the ascending of the sap, by means whereof the bleeding ceases, and the wound consolidates again, before the more liberal ascent of the sap: much more then will it check the growth of a weak herb or flower.

Rain and
snow-
water.

§. 6. Rain-water seldom sinks above a foot deep, but water of snow two or three feet deep, as being much

much heavier than rain-water; and as it melts slowly and by degrees, from the undermost part of the mass of snow, so it soaks with more ease, not being hindered by the wind or sun. — Therefore (says Monsieur de Quinteney) as I dread much snow upon moist strong grounds, and order it to be removed from about the fruit-trees, so in dry earth I gather it as a magazine of moisture to the southern expositions. fo. 29.

§. 7. Worlidge, fo. 248. says, it is observed to be the best to sow in the dusts, whereby the seeds gradually swell, from the cold dews of the night and from the air, and are made ready to sprout with the next rains. So it is not good to water new-sown seeds till the long defect of showers invite you to it; some seeds, as radish, lettuce, gilliflower-seeds, &c. remain not long in the earth, and therefore may in two or three days, for want of rain, be watered; but tulips, auricula, parsley, carrot-seed, &c. lie long in the ground, and require not so speedy an irrigation. Watering seeds.

§. 8. It is better to water a plant seldom and thoroughly, than often and slenderly, for shallow watering is but a delusion to a plant, and provokes it to a root shallower than it otherwise would, and so makes it more obnoxious to the extremity of the weather. Mortimer, fol. 455. Of watering plants.

§. 9. The reason, I conceive, why plants or trees once begun to be watered in the heat of the summer must be continued on, otherwise it is worse than if they had not been watered at all, is not because a tree once watered needs it the rather, but because watering in the heat of summer makes the ground subject to chop the more when dry, and therefore such ground must be kept moist. Of watering trees.

Mr. Bobart, of the physick-garden in Oxford, says, that it would be a very good way, in dry summers,

mers, (where water can be had) to water all sorts of fruit-trees, for sake of the fruit-buds and bearing shoots, and shoots of the wood for the following year, which are all formed in the August before ; which do miserably fail by reason of the drought.

I have heard it reported more than once, how constant and great burthens of fruit orchards have had, where the owners had power of throwing the water over them ; of this it seems the antients, particularly Cato, had a great opinion, when (in book 1st. de Rustica) next to the vineyard, he gave the preference to hortus irriguus ; it is no wonder if they soon found out the benefit of the command of water to trees in hot countries ; it seems to be expressed by Cato, as if an orchard was no orchard without it ; and though our clime stands not so absolutely in need of watering, yet by this hint we may conclude how, in some hot summers, and dry grounds, an orchard is of little value without such convenience.

Of watering fruit-trees in bloom.

§. 10. Want of rain at blossoming-time often makes the blossoms drop ; by watering these trees have bore abundantly when none others did. Mortimer, fol. 529.

Of watering apples when the fruit is small.

§. 11. This exceeding dry summer I observed apples were rather smaller than usual, which Stevens of Pomeroy, my tenant, perceiving, and that his trees were well loaden, he in good time began watering his trees often, pouring down leisurely two or three buckets full of water to each tree : which bounty his trees soon began to be sensible of ; for whereas before, his and his neighbours leaves of their apple-trees were pale and shrivelled, his soon recovered a strong deep colour, and he was very sensible his apples looked of a livelier fairer colour, and grew larger.

WORKMEN and WORK.

§ 1. **T**AKE care to man the hay-harvest Man well
the harvest. with enough people, for I find, by understanding farmers, that it helps to the dispatch mightily, if it be any thing of a good hay-making day, to turn even the grafs swarths that same day.

The not well manning a harvest, has either of these three effects, viz. that corn is over-ripe, or being cut down, is not carried in without damage, or is cut down too soon, for fear lest it should all ripen together on you ; the disadvantages of the two first are very apparent ; and for the disadvantage of the latter, your corn shall yield two shillings in the quarter less than if it had been properly ripe : and two men extraordinary are many ways needed, both to carry on sowing, dung-carting, thatching reeks, or odd necessary things.

§. 2. Whereas men's hands are not only wanted Proper
times for
different
works. in harvest-time, but in seed-time also, therefore great care ought to be taken by forecasting, to do all works before those times, which otherwise must of necessity be done then ; therefore let no thatching, carpentry work, mending of hedges, or other work, whereby the labourer may be called off, be delayed till then ; which will not only put you in a hurry for want of men, some of whom may be such indifferent workmen as you would not employ but on necessity, but hereby you are obliged to be often calling off the labourers from the works they should stick close to, whereby you cannot so easily take an account of their works.

Take care how you bring yourself under two dilemmas at the same time in your husbandry : as for example, to be under equal inconveniencies if wood-carting is not performed to-morrow, and ploughing
or

or sowing, when you have but one team to supply these double duties : or again, to be obliged to keep folding your whole flock, because you cannot otherwise manage the corn you have undertaken, when another way you sustain as great a loss by the not having the liberty of making the best of your lambs and old sheep, by fattening them to a good advantage : if you run yourself into such inconveniencies daily, it will daily take off a considerable part of your profits : and though you take the best care to free, and make yourself easy from such incumbrances, the nature of husbandry will unavoidably force such difficulties too often upon you ; for there are critical seasons offering themselves for some things to be done, in which one would be glad to have three times the number of men and horses, that are requisite in course, to carry on the business of the farm.

Leave
nothing
for winter
that may
be done in
summer.

§. 3. Avoid all manner of winter work as much as possible (except the direct husbandry of ploughing) all cartings wear out your plough-timber abundantly, foul and wear out your lanes, unless frosty ; and so many lets happen by bad weather, that man and horse often, for a long time, earn not half their pay : bring not yourself therefore under necessities of winter work, by picking up stones for highways, which you must be necessitated to remove because of your ploughing up the ground ; by leaving any ways undone in summer, that must be repaired in winter ; one load of stones in summer going farther than two in winter, and then carting to that end hurts the ways as much as mends them : let your hedges, where damage may arise, be therefore well in repair before winter, that there be no works of necessity in wood-carting : let all carpenters work, bricklayers work, pitching or paving work, be foreseen in summer, that by bad weather and short days they may not

Of the FARM-YARD, &c.

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not lose half their time in winter: bad wet weather in the winter is not fit for any sort of carting, such as wood, dung, chalk, &c. (but to plough white land in the hill-country, and in moderate frosts you ought to be fallowing) and if you leave such work undone, depending on the winter, you will be at a much greater loss to finish it, on account of unseasonable weather, than you will be at a loss how to employ yourself in case the hardest snow and frosts come: for then there may be dung and chalk-carting, carting stones in heaps, which may be took up by the shovel: going to the best markets that are farthest; and no ingenious contriver, be the frost never so long, can be at a loss to invent work for that season fully to employ him.

§. 4. The labourer's lazy time for work, when they want the master's eye most over them, is about three weeks or a month before harvest, when ^{When} work ^{workmen} ^{do least} ^{work.} of all sorts grows scarce, hay-making and faggoting, and dung-carting being over, and most other works out of season; then they are apt to spin out their time, and linger it on to harvest, that they may not want employ.

§. 5. I advise every farmer to employ a nimble, ^{Of jobs.} active, and free-labouring man, in such business as consists in jobs and fractions, and employ the dull heavy man, if such he employs, to single works, such as threshing, &c. whereof an account can be kept; for a lazy lubbard will lose half his time in the vacancies between one work and another, if you employ him in many in the day.

Of the FARM-YARD, &c.

§. 1. **M**R. Raymond advised me to fence about ^{Of a mud-} my backside with a mud-wall; he said, ^{wall.} it was not only ornamental; but the cheapest and

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most

most serviceable of any ; he gave but sixpence per lugg or pole of a foot high, and two feet and half broad : but indeed, if he made it nine feet high, he gave five shillings and six pence for nine lugg of that height : he added, that in keeping my cattle warmer by such a wall I might save half my fodder.

Of the
stable.

§. 2. When I shewed several understanding farmers my stables that were building, and told them I proposed but four horses on a side, whereas in my farmer's stables they allowed six horses to those dimensions, and would reason it to be sufficient, by saying the horses would not lie down all together, and it was sufficient for the standing ; they all replied, they hoped I was wiser than to regard them ; that too narrow room might be the spoiling of a horse, whose value might pay for the enlargement.

H O G S.

Marks of a
good hog.

§. 1. **T**HE marks of a good hog among the ancients, according to Varro and Columella, were a small head, short legs, long bodies, large thighs and neck, and the bristles on the last mentioned part thick set, erect, and strong. In Wiltshire they look on huge heavy lop-ears in a pig, as a very good sign of his making a great hog.

Spayed
and gelt
shutes.

§. 2. I asked Sir Ambrose Phillipps's shepherd, whether the country people made any difference in the price between spayed and gelt shutes, provided, in other respects, they were equally good ; he said, they would not draw out the gelt shutes unless they had a better price, though he knew no other difference, but that the gelt pigs would be the masters over the spayed, and so fare better, and consequently thrive better.

Signs of an
unthriving
shute.

§. 3. A gentleman in my neighbourhood bought half a dozen young shutes (of about nine shillings value) ;

value); when they were bought I thought them big enough for the money, but did not like their shapes, being not long and strait, but their rump bones rising a little; but what was the worst sight and omen, these hogs, though of little bodies, had long hairs and bristles: he kept them three months, gave them four bushels of vetches, and very good keeping; then put them up for porkers, and gave each a sack of peas, and would then be glad to sell them for the prime cost, and the price of the peas they had eat, so little did they thrive: the length of their hair I take to be an ill sign, when their bodies are not proportionable, for it shews the hogs have had some check, which notwithstanding hinders not the bristles from growing, no more than sickness does a man's hair or nails: and one had better buy hogs in a backside than in market; for one cannot see so well what is a proveable hog in a market as one can in the backside, when he is among those of the same litter, and the most proveable pig is cheapest, though dearest at first cost.

§. 4. The breed of pigs I had of farmer Stephens ^{Of hogs} of Pomeroy in Wilts, which were used there to whey ^{degenerat-} and grafs, being removed to Crux-Easton, where ^{ing:} their food was corn and wash, did bring but three, four, or five pigs at a farrow, and so the descendants of them continued to do for three or four years, which I impute to their degeneracy, for want of the same food they and their parents had been used to.

§. 5. * Varro says, we may judge of the fruitfulness of a sow from her first litter; for she generally ^{Fruitfulness of hogs.} brings about the same number ever afterwards.

§. 6. I kept four sows, but soon grew weary of ^{Keeping} their farrows, for to a boy or other servant, that is ^{sows un-} to feed them, a great deal of corn is to be committed, ^{profitable:}

* *Sus ad foeturam quam sit fecunda animadvertunt ferè ex primo partu, quod non multum in reliquis mutat.* Varro. *l.* 56.

both on account of the sows and weaned pigs, and in the favour that must be used to them when they come to be shutes : if such servant either gives them not enough, or your corn wastfully, or neglects them some hours, either thro' idleness, or being otherways employed ; in either of these ways, the profit of breeding these creatures is lost ; and if we make up the account how much corn the sow eats us, the weaned pigs, and shutes, they eat out their heads ; especially considering, that in every year you keep your sow you lose twenty shillings, inasmuch as a pig ought to pay so much, and, when you kill your sow, the bacon is nothing near so good : I infer from hence, that it is no ways proper for a gentleman to be a breeder of pigs, or other young creatures, as poultry, calves, &c. any farther than a convenience is to be regarded, but rather leave them to farmers wives, who can tend them themselves punctually in all respects ; nor can I apprehend the profit to be any thing to them, notwithstanding their offal corn, which they might sell : we say a sow will undo a poor man, and we observe they never keep them notwithstanding they may feed them with their own hand, and see nothing be lost.

I find great inconveniency by having four sows this year, not only on account that the greater pigs are the more neglected, such attendance must be on the little pigs, but also on account of the harvest coming on, against which time, and in which time, a boy's business should be to give the birds disturbance, and break them off their haunts, and drive the drove of pigs early into the field a leasing, at which season his time is lost (which is too precious to sling away) in breakfasting the little ones ; besides, at that time a spare hand is very useful, for an hour or two, in the garden, when no weeders can be had.

§. 7. They

§. 7. They count in Wiltshire, breeding of pigs ^{Of breed-} not to make so quick a return as buying in of Welch ^{ing hogs.} pigs, and fattening them off with whey as fast as they can: a pig bought in will in six weeks, or two months, be very good bacon, or pork, and pay at least eighteen pence or two shillings per week. In Wiltshire they order it so, that the sows farrow not till May, because their dairy comes not in till then; but he that intends to keep no cows, must order so that his sows farrow six weeks before harvest, that at harvest the pigs may be able to go into the field.

A certain dame was commending the breed she had of sows and pigs; I replied, I thought them to be the smallest sort; she said, the farmer could not abide the great large sort: I asked her what was his fancy for that; she said, that the pigs, that were farrowed in March, of the greater sort, would not make porkers in winter, for they would keep on growing still instead of growing fat.

Besides the trouble of breeding pigs, it is well to be considered, whether you can maintain the young shutes as well as the old ones between the leasing of the harvest and fattening, for, if not, you must be forced to thresh out barley the sooner, when most likely it is the cheapest; nor likely is there more waste corn in the field than the great hogs of a farmer can pick up.

§. 8. Sir Ambrose Phillipps had a hog, which ^{Of a boar} they thought to be gelt, and put him up to fattening, ^{with his} but he never fattened kindly, and, when they came to ^{stones in} his back, ^{his back,} kill him, they found his stones in his back; his bacon shrunk and eat strong: the shepherd says this is common to lambs, which when, at cutting-time, they find, they fat them up; it is common, he says, also to horses.

§. 9. They give the sows in Leicestershire, that ^{To make} they may take boar the sooner, a good piece of lea- ^{a sow go} to boar.

ven once in twenty-four hours, for two or three times : it is nothing but the green dough made as common leaven.

Of the
sow and
pigs.

§. 10. I was going to buy a sow and pigs, and consulted several persons about the managing them, who acquainted me of these particulars, viz. — First, That a young sow, as this was but a year old, would bring but small pigs. — Secondly, That being a young sow, and having so many as nine pigs, it could not be expected any of them would be so properly fat for roasters, as if she had brought but four or five. — Thirdly, That this sow had come too early for most farmers keeping, though, if they had keeping for them, it was best of all, because, if not stunted, they would be young bacon within the year. — Fourthly, That such young pigs, and other lean pigs, should not have their bellies full given them at first of sweet whey, for by that means they often burst their bellies. — Upon which I asked a Wiltshire dairy-woman about it, and she said, she never knew them break their bellies ; but one of our Hampshire women replied, it was because in their country they skimmed the cream off to make whey-butter, which took off from the lusciousness.

^b Varro's rule is to save as many pigs as the sow has teats : if she brings fewer, says he, she is a bad breeder, and not profitable to keep, and if she brings more, it is very extraordinary.

Of sows
eating their
pigs.

If a sow be high in case when she farrows, I am informed, she will be apt to eat her pigs. The first farrow of a sow is accounted the worst.

Bean-flour
good for
sows with
pigs.

§. 11. I told a notable dame in Wiltshire, that I thought to give my sow and pigs bean-flour, instead

^a *Parcere tot oportet porcos, quot mammas habeat, si minus pariat, fructuariam idoneam non esse ; si plures pariat, esse perentium.* Varro, fol. 56.

of

of barley-flour ; she said bean-flour was best, and would breed most milk ; but when she gave them barley-flour, she used to have some oats ground with it.

§. 12. Whey is more nourishing to pigs than skim-milk. ^{Whey good for pigs.}

§. 13. I had little pigs of about six weeks old newly weaned ; my bailiff was of opinion they would turn up the meadows and corn-land, and dig worse than older pigs (it was then just the opening of the stubble) he asked me why I did not ring them, for by that means the sow would not endure them to hang on her ; for the pigs, though weaned, did run after the sow and would be lugging her teats ; he said it was a common thing to ring the pigs they designed to wean, in order the sooner to wean them, for, being ringed, the sow would be hurt by their sucking, and so forsake them sooner.

The smith came to ring my little pigs ; I attended the operation ; he said he never spoiled a pig in his life, which put me upon asking the question, whether pigs were ever hurt by ringing ; he replied, yes, often ; for, said he, if you run them through the gristle of the snout, which lies on the bone and beneath the fleshy part, the pigs noses will often swell and rangle so as to kill them ; therefore great care must be taken that the ring be only run through the fleshy ridge of the snout : again, said he, if the ring be twisted too close to the snout, so that it binds too hard, and cannot run round with ease to the pigs, their snouts will swell, in which case the rings must be taken off, and the snouts anointed to give them ease.

Ring not a sow with pig, lest in the dispute she cast her pigs, nor endeavour to take an oat-hull out of a cow's eye forward in calf, lest she warps.

Of cutting
and spaying.

§. 14. May the 17th, 1700, farmer Elton cut and spayed his pigs, which were sixteen weeks old: the same day, by the same gelder, farmer Biggs, my neighbour, spayed his, which were six or seven weeks old: they did very well, and fell to their meat presently; but farmer Elton's pitched, and would not come to their meat, nor eat of wash, when they called them to it, till the fifth day, at which time they began to feed; the farmer thought he should have lost them; I asked dame Biggs what she thought could be the meaning that there should be that difference between their pigs; she said, possibly farmer Elton's might be too hoggish and rank, and then they are apt to pitch; now I had observed, before they were cut, that they were apt to ride one another: upon this, I enquired of an understanding farmer, when he thought it was best to cut and spay pigs; he said, the boar-pigs, the sooner the better, if it was in a fortnight or ten days, as soon as their stones were come down; there was the less danger, and they would pitch the less upon it; nay, if a pig was cut in that time, designed for roasting, it would be never the worse: as to a sow-pig, said he, they cannot be spayed under five, six or seven weeks old, and then is the time for it; in two or three days after this I came into Wiltshire, and asked farmer Pain the same questions, and he agreed to what the farmer last mentioned had said.

I had little pigs cut and spayed the 3d of September; it was agreed it was not fit to defer it, because the weather would soon grow too cold, and, when they are cut or spayed, they must be kept moving and walking for three or four hours, lest by laying down too soon, they should swell.

If pigs be cut (or especially if spayed) they ought not to be suffered to creep through hedges, lest the thread which sows up the spaying hole, be drawn out,

out, or the place bruised; nor ought they under a fortnight's time, in such case, to be ringed, lest they struggle and hurt themselves.

A sow-gelder that had cut for me, cut four pigs for a neighbouring farmer, and the pigs happened to be broken-bellied, and they died on the spot, their guts coming out at their cuds: I asked whether it was usual for pigs to be bursten-bellied; they said, yes; and that if they were cut young, they do often not perceive it, but if they did, they should forbear to cut such pigs, or, when cut, should take great care to sew up the skin.

If a boar-pig be cut or gelt, his tusks do not grow; which seems to shew a strange consent of parts between the stones of a boar and his tusks; and this seems to hold vice versâ; for this month (September) I broke the tusks of a large, fierce, and most venereous boar, which before was riding all the gelt and spayed pigs in the backside, and would all the days and nights lie close to the sow that was brimming, having at that time seven sows, and would go over walls and pales after them, five feet high, but when his tusks were broke, he begun, from that time, to abate his venery, and carried much less regard to them, and grew dull in his courage; I take the more notice of this^c, because I observe the anti-ents took the like notice of the relation between the cock's stones and his spurs.

They told me it was common among the pig-jobbers to put off a farrowing sow for a spayed sow, by cutting a slit in her side, and sowing it up again; I asked what that cheat availed the seller; they said,

^c Of making capons (says Columella, lib. 4. cap. 1. fol. 185.) semimares, capi, qui hoc nomine vocantur, cum fiat castrati, libidinis abolendæ cau:â, nec tamen id patiuntur amissis genitalibus, sed ferro candente calcaribus inustis, quæ cum igneâ vi consumptæ sunt, facta ulcera, dum consanescant, figulari cretâ linuntur.

such a sow was worth less by two shillings or half a crown than a spayed sow, for there is hazard in spaying.

A sow will not fat, unless spayed before put up to fattening, but will be continually riding the other hogs, and hinder them also from fattening; wherefore it is common to spay them a fortnight before.

It was July the 25th, and the sow-gelder was with me to have spayed my sows (for it seems that is a good time in order to their fattening before harvest); but we thought them rank, that is, desirous of the boar, and so we would not let him undertake it, for we look on it to be two to one but in such case it will kill the sows.

It is generally said, that it is good to spay a sow two or three days before her litter of pigs are weaned, because in case she should take harm, the pigs will draw off the venom; or, without being spayed, she may be fatted at Michaelmas, because being young with pig will not hurt her.

Of turnips
for hogs.

§. 15. I was telling a person of great repute in husbandry matters, that I could not make my pigs, in the winter, eat turnips, which was a great loss to me, for I could not keep so good a winter stock as I otherwise should; but he assured me, he kept, one winter, a great many pigs by turnips; he said, he mixed some bran with them, and scalded the turnips, but, said he, they will not eat the scalded turnips without bran.

Of grains.

§. 16. In managing hogs a gentleman has a good advantage above the farmer in this respect, inasmuch as in March (when the corn is almost threshed out) great store of drink may be brewed, with the grains of which many pigs may be maintained till the middle of May, when the broad-clover comes in; and in October another great brewing may be had, to supply a great quantity more of grains, so as to maintain

maintain porkers (if pork in October and November sells cheap) till December and January, when it is more likely to sell dear, for pork at the fore-hand of the year, viz. September, October, and November, is likely to be cheap, inasmuch as the gleanings of the harvest do raise the porkers to a great height, at which height they must be killed, because they cannot be maintained at it.

§. 17. It is a common thing to sow half an acre ^{Goar-vetches} of goar-vetches for hogs, where farmers keep a great many, and they will eat them greedily, if the ^{good for} goar-vetches run gross, and you give them to them when gross, and before they run far in flower.

§. 18. In Wiltshire they count vetches too hot a ^{Vetches too hot for} food to give pigs, which is apt to give them the measles; and therefore they mix corn with them. Mr. Ray speaking of the vetch says, fol. 900. they are used in England as food for horses mixed with peas and oats; and adds, as peas are loosening, and of great virtue, so vetches are binding, and have no good virtues.

§. 19. I find broad-clover not only excellent for ^{Broad-clover good for porkers.} keeping pigs to a height in March and April, in which months the farmers corn is gone, and the dairy not come in, but also excellent for heightening up porker shutes, after the gleanings of the harvest is over, all the months of September, October, and part of November, at which time pork is at the cheapest, because the harvest has fatted so many, which people must sell, because, after the gleanings are over, they cannot maintain them; whereas, by the help of this clover, with some little other helps, the porker shutes may be kept on longer.

§. 20. I asked some farmers of experience, if ^{Broad-clover swells} pigs would not take the same damage by broad-^{young} clover as cows; they replied, that the full-grown ^{pigs.} pigs would thrive exceedingly with it, and be good pork,

pork, but that it would scour the young pigs, tho' of twelve, thirteen, or fourteen weeks old, and make them swell as big as two, but they never knew it kill them; on the whole it was agreed, that hogs will grow very fat by broad-clover, yet they never care that their young shutes and pigs should eat much of it, for it not only swells them for the present, but makes them pot-bellied.

Henbane
good for
hogs.

§. 21. Henbane is beneficial and nutritive to hogs (as Dr. Mead observes, in his *Essays on poisons*) tho' it kills poultry.

Warm
wash in
winter.

§. 22. If any person in the winter time keeps thirty or forty hogs, as I and many hill-country farmers do, I do advise, if they have the building of their own hog-houses, wherein are their cisterns for their hog-wash (of which I have one holding about eight hogheads) to set up a copper also and furnace therein, handy to put in the wash, which may heat the wash for the hogs in the winter; I find it to be very profitable.

Nuts bad
for hogs.

§. 23. A butcher this day (September the 3d) wanted to buy some porkers and bacon hogs of me; my corn-crisp was just eaten up by them, so I told him I would gladly have parted with some of them, if I had not hoped they would take to the nuts, which were in abundance in my coppices; he replied, the nuts would hurt them; nuts would make their fat soft and greasy, so that it would boil away, and nuts, being so sweet, would make them so sweet-mouthed, that the lean ones would not take to their wash when the nutting season was over, nor those, that are to be fatted, to their peas; and they would lie in the coppices whilst any nuts lasted, though there were not a tenth part enough to maintain them, or to keep them from pitching: my cook said, all this was true; she knew it to be so by experience: I asked her how she knew this: she said

said she had lived in families that had had the experience of it, and had heard many say to the same effect: my woodman and other labourers do agree in it; but they add however, that, if such bacon be put in the pot boiling a gallop, it will make it boil firm.

§. 24. Farmer Collins of the Isle of Wight assures me, that if the pigs meet with a piece of hemlock-root, in their digging up and down, be it never so little, they will be perfectly mad, and jump as high as an ordinary chimney-piece, and it is great odds but they die. Hemlock-root poisons hogs.

§. 25. Mr. Edwards chid his man for suffering his pigs to lie at night in the dung of the backside, and for not accustoming to chace them to their sty: I asked him what was the reason for it; he said, their lying in the dung was not accounted wholesome for them; for the heat of the dung made them so tender, that they would not endure the cold so well, nor thrive with their meat so well. Not to let hogs lie in dung at night.

§. 26. Mr. Edwards, and my neighbouring farmer, and I, were discoursing upon hogs; Mr. Edwards said, the farmer kept hogs in too good a condition before he put them up to fatting; the farmer replied, there would be the more lean, and therefore the bacon the better; for lean must be a long time making in a hog, and if a lean hog were soon fattened up, though you might raise him to what degree of fatness you pleased, yet such fat would shrink and boil away: the farmer said, the great cotshill-pea is much the best pea for fatting hogs, and a quarter of them would go much farther than a quarter of the others, the which they would not swallow whole, as they would many of the partridge-peas. The underling hog put up with the rest, is longest a fatting, being beat off by the rest, so makes the fattest bacon; that bacon therefore they generally keep for beans. Of fatting hogs.

At

At Newbury I met farmer White of Catmore ; we talked of fattening pigs ; I said I believed beans to be as good to fat with as peas ; he said, he thought so too, and many persons about him did fat with them ; he thought change was very good, which kept them up to their stomachs, and said, you must begin with beans, for after peas he thought they would not eat beans, peas being the sweeter food ; he and farmer Stockwell did both seem to agree (that in reason, though they never tried it) the flour of beans or peas would fat better than the whole grain.

I find farmer Farthing, and my tenant farmer Wey of the Isle of Wight, without regard to the price of peas, be they cheaper or dearer, do still fat with ground-oats, and barley, and do allow a bushel of barley to a sack of oats ; they say, the reason for allowing barley to the oats is to make them both grind, for otherwise, I conceive, the mill could not be set fine enough to grind the oats by themselves : they assure me, the hogs will fat thus much sooner than with peas, but, I suppose, if peas could be ground, it would alter the case, for hogs seem very voracious of peas, and to chuse the pea-stubble beyond any other ; they fling also into the trough, when they feed them, if there be many of them, a handful of bay-salt, but if that be not to be had, other salt, which makes them drink very much, and contributes to their quicker fattening.

In discourse with farmer Bristow, I observed, that the smaller peas were sweetest, and discernable so to our taste, and the small grey partridge particularly sweeter than the great partridge, and therefore, tho' the great partridge was always dearest, yet the lesser would fat a hog sooner. He said, his father, who lived near Reading, and the farmers thereabouts, gave their hogs the white boiling pea, and that they fattened much sooner ; I answered, undoubtedly

edly the blue pea (which of all field-peas is the sweetest) would for the same reason fat hogs soonest; he replied, no; for he could assure me, that about Reading they had tried them, and had found they made the hogs scour; therefore it seems they are too luscious and cloying.

Farmer William Sartain of Wilts came to see me at Easton, June the 8th, and I carried him into my corn, and shewed him several sorts of peas I had sowed, viz. great grey partridge, or Windfor-greys, Burbage-popling, and blue peas; the farmer assured me, that though blue peas, if they boiled well, would sell for most on that account, yet the grey-partridge would fat hogs better than the Burbage-popling, or blue-pea, as he had observed on experience; and he said also, that though the popling and blue pea seemed sweeter, yet the hogs would prefer the great partridge to them, as he had often experimented, by laying all three sorts in distinct troughs before them.

Mr. Smith of Stanton, a very experienced farmer, assures me, that the best way of fattening hogs is thus; viz. to give them, when they are first put up, rough corn, or peas wads, that they may work upon the halm, which when they have done for two or three days, he then gives them threshed peas in troughs, and also a service, once or twice a day, of wash; and this he continues to do for two or three days, and then he plies them in the usual way, with peas altogether and water; by this means they are not at first glutted and surfeited, but kept to a coming stomach, and are by degrees initiated to a full diet. — However, it is agreed that hogs should be well swilled with wash before they are put up for fattening, otherwise they will make themselves sick for two or three days.

I observed two pigs, after they had been about three

three weeks in fattening, to look very lank in the flank; notwithstanding this it was agreed they were very fat; and that pigs would bluff and swell much with their feeding the first six or seven days, and look fatter to the eye than afterwards; for, when they gather fat inwardly in their bellies, the weight of it draws down their bellies, and makes them look thinner and lanker.

Of fattening
a boar.

§. 27. A boar is fit to be killed when less fat than a hog; for all the soft fat between the flesh and the horn will be, for the most part, boiled away, therefore to no purpose to make it very fat.

If any gentleman keeps a boar for fattening, I advise him to be provided with another young boar to brim the sows, against the time he put up the old one to fattening; for by experience I find, that, though the fattening-boar be penned up at some distance from the backside, and out of the road of the hogs, and hedged out from them, yet the brimming sows will rig over or under hedges to him, or labour so long at the gates till they shall open them, and, if they once get to the outside only of his pen, it does the boar more harm than a fortnight's meat will do him good.

Of a gelt
hog and a
sow.

§. 28. Mr. Edwards and others I find do agree, that a gelt hog fattens most in the back, and a sow in the belly.

Not to send
fat pigs a
leasing.

§. 29. About Holt in Wiltshire, the farmers never used to turn their forwardest pigs into the corn-fields, for they, that were near half fat with whey, would never go a leasing to any purpose, but would either come home again, or lie down under the hedges, so that they would come home worse than they went out; therefore they usually buy lean pigs against such time.

Clean
straw for
hogs in fat-
ting.

§. 30. Of hogs, says the *Maison rustique*, fresh straw often given them doth fat them as much

as their meat, and you must take care their troughs be always clean, fol. 147. Special care must be taken that their meat be not cold, nor too thin, lest it cause them the flux in their bellies. * Columella has the like observation in regard to keeping them clean.

§. 31. In an acorn year the hogs will not thrive ^{Of acorns.} proportionably on the mast, at the first part of the season, as they will after wet has fallen, to make the acorns * chissum, for then they are far more nourish- * Grow. ing.—They are apt to scour hogs, when eat new from the tree, and are not then so good, as when they have laid in heaps to sweat.

§. 32. A sign to know if a hog be sick, is, when ^{Signs of a sick hog.} he hangeth his ears very much, and for your better certainty thereof, pull from him, against the hair, a handful of bristles off his back, if they be clean and white at the root, he is sound and healthful, but if they be bloody or otherwise spotted, he is sick. *Maïson rustique*, fol. 149.

§. 33. The signs of a measles hog are blackish ^{Of the measles.} pustules under his tongue, and if he cannot carry himself upright on his hinder legs, and if his bristles are bloody at the roots. *Maïson rustique*.—* *Alfo Florentinus in Geoponicis*.—* *Didymus* tells us that *Democritus* prescribed for this distemper in hogs, bruised asphodel roots to be given to them mixed in their food, and says it will cure them in less than seven days.

§. 34. If a pig is hot in his body, which is to be ^{Of the fever.} known from the driness of his dung; two spoonfuls ^{of}

* *Quamvis prædictum animal in pabulationem spurcitie verferatur, mundissimum tamen cubile desiderat. Columella, lib. 7. fol. 181.*

* *Qui ipsos emunt ex pilis de jubâ evulsis sanitatis ipsorum notas sumunt; si enim fuerint cruentati, morbum indicere aiunt, puros contrarium. Florentinus in Geop. fol. 468.*

* *In quem casum Democritus physicus asphodeli radices modicè tuse minas tres cibo singulorum suum admiscere jubet, &*

of fallad oil in a pint of warm milk, such as comes from the cow, will cleanse him, and bring him to his stomach again. † Didymus prescribes bleeding in the tail.

Of the
murrain.

§. 35. Mr. and Mrs. Edwards say, the murrain in pigs (for as much as they can observe, and as their doctor for drenching tells them) proceeds from their being in too great proof, and ease; many hold that musty corn will give them the murrain; as soon as they observe it in one, they drench all the rest.

It was the 25th of August I had a hog died of the murrain, and many hogs did die about the country; I had some powders to give them in their wash of grains, which I could not get them to eat of, it being stubble-time; my bailiff said, he could not ever, in the like case, get them to eat of grains, but the way was to give them it in skim-milk, and then they would eat it.

This (1705) was a wonderful dry summer, in which for three weeks we fetched water for our cattle; about the latter end of October I had a sow with pigs fell ill, and in a day or two after a fatting hog fell ill and died; we sent to the hog doctor to drench all the hogs, who said, Mr. Whistler had lost six, and that they died in many places, and the cause of the murrain was the mighty dry summer, whereby the hogs had not water in plenty to drink, nor mire to roll themselves in: therefore after such dry summers drench hogs by way of precaution.

Of the le-
prosy.

§. 36. Mr. Boyle, in his Advantages of experimental philosophy, recommends antimony to cure the leprosy in swine, it being a great sweetener of the blood, and says also, it is very good to cure the worms in horses.

ante septimum diem integram sanitatem inde recuperaturos testatur. Didymus. fol. 470.

† Si febricitent, sanguis è caudâ emittendus. Didymus, ib.

§. 37. A

§. 37. A noted pig-doctor in Hampshire advises me, if ever I bleed a pig in the tail, to cut off his tail above the hocks, and rub it first, it will bleed the better: pigs by having too little of their tail cut off, especially in the summer, when troubled with flies, will be knocking it about their hocks, and keep it bleeding so as to bleed to death. Note, he says, the long-legged hogs, as it were double-jointed at the knee, are of a breed subject to the staggers.

§. 38. We had a young pig of three quarters old; we killed it for bacon; the farmer said, though I gave six shillings per score, the pig eat him as much ^{Young pigs not profitable for bacon.} peas as he was worth, for, said he, a young pig, though he makes the best bacon, yet fats not so fast as a pig of full growth, for his food runs into growth.

§. 39. I bought a hog, and when it was swilled, the farmer commended very much the swilling of it, because it was in no place burnt; whereupon I asked him if it was usual to have them burnt; he said, where the hog was dirty there would be danger of it's burning, which in that place spoiled the bacon. ^{Of swilling a hog.}

The chief or only damage of burning a hog in swilling is, that the bacon will be apt to rust there.

Care must be taken, after hogs are swilled, that they be not bruised.

§. 40. Remember to provide a stock of salt in the most dry season of the summer, because it will come dry to you, and is at such times always cheapest; for the salternes at such times, being able to make a greater quantity of salt than they have stowage for, sell it the cheaper. ^{Of salt and salting.}

Of drying
bacon.

§. 41. A hot fire in a chimney, which heats the bacon, and then letting that chimney be without fire again, makes the coat of such bacon slack, and brings'a rust into it.

P O U L T R Y.

Number of
hens to a
cock.
Hemp-seed
makes hens
lay.

§. 1. COLUMELLA, speaking of cocks, says, one cock is sufficient to five hens.

§. 2. Mr. Ray says, hemp-seed is looked on to make hens lay, even in winter, but to incline them to so much fat as to prevent their kindly laying after; it is pernicious to be given to singing birds alone, without other seeds; it either kills them with fat, or makes them dull in singing.—^a The antients were of opinion that the leaves of cytissus made hens lay. As to the age, when hens are in greatest perfection for laying eggs, they preferred those of two years old.

Of eggs

§. 3. In pursuance of what I have remarked before in regard to the punctum saliens in seeds, viz. that it is answerable to the sanguinea gutta in an egg, and like that is a vital principle, which has action antecedent to bare rules of matter, and is owing purely to the will of God, suitable to Moses in Genesis, I do conceive farther, that the punctum saliens in a seed, as also the sanguinea gutta in an egg, have each alike their systole and diastole, that is, an opening and shutting in a springy manner, and that, if the egg is heated, or under incubation, the yelk being immediately attenuated by heat, does insinuate some of it's parts

^a Cytisi folia viridia ipsas fecundissimas faciunt. Aptè ætate ad parienda ova sunt anniculæ, maxime vero bientes, minus his valent seniores. Florent. in Geop. fol. 379.

into

into the opening of the heart or sanguinea gutta of the egg, which in it's reciprocal shutting motion squeezes the juices into the passages and first lines already formed, although wonderfully short and fine, which are the main branches of the bird; thus they are lengthened and thickened by each opening and shutting, till the whole yelk is absorbed; thus the flour also in the seed is attenuated by moisture and heat, till at length it is quite swallowed by the punctum saliens, which like an engine casts it into the vessels of the plant: these are the food both of plant and animal.

Columella lays it down as a rule, that eggs ought to be set at ten days old, whereas in England they may be set well at thirty; the reason is, because the heat of the air in Italy is strong enough to act so on the sanguinea gutta as to lengthen the fibres so far, and to make such progress towards the growth of a chicken, that the circulation to the extremity of these fibres cannot be maintained, and consequently not the nourishment of the chicken without a greater heat, for want of which there is a failure, if not committed to incubation; but the air of our climate works so slowly, that it scarce forwards it.

I asked a notable dame whether it was true, that if a hen was kept too fat she would lay an egg without a shell, and a lesser egg; she said it was true: I asked whether she had a hen sometimes crow-trodden; she said, her people would say so sometimes, and such hen's feathers would stare; it fell commonly on a hen that was black; but Mrs. Edwards affirmed, she had known it befall other hens too; they said it was incurable. I the rather mention this, because Mr. Markham affirms it in his book of husbandry, in his chapter of Poultry.

^b Eggs that are new laid may be known by their roughness and whiteness, and if you hold them up to the sun, you will find a transparency in them, which is not in eggs that have been sat on two or three days. If they are sat on, Florentinus cautions us not to shake them for fear of destroying their vital principle. Varro says the same, and adds, that addled eggs will swim in water, and good ones will not.

Of setting
hens.

§. 4. ^c The antients, in many parts of husbandry, had a very great opinion of the influence of the moon, and accordingly in setting hens, Columella directs it should be done from the tenth to the fifteenth day of the moon's increase; which is not only of

^b Dignoscantur ova, an quod in ipsis est fecundum habeant, si post quartum diem incubationis ad solis radium contempleris; si enim quid fibratum transiens apparuerit, & subcrevissent sit, quod inest fecundum erit; si vero pellucidum erit, ova sterile ejiciatur. Sed experimenti sumendi gratia, ova non sunt concutienda, ne quod in ipsis vitale est corrumpatur. Floren. in Geopon. fol. 379, 380, &c. — Ova plena sint atque utilia necne animadverti aiunt posse, si demiseris in aquam, quod inane natat, plenum defidit.

Ova si incubantur, si habent in se semen pulli; curator quadriduo postquam incubari ceperint, intelligere potest; si contra lumen tenuit & purum uniusmodi esse animadvertit, putant ejiciendum, & aliud subjiendum. Varro, lib. 3. fol. 72.

As our author has given no directions for preserving eggs, the following short note may perhaps not be impertinent. Some dip them in hot fat, which, if care be taken that they are not overheated by it, may be a good way; but as easy and cleanly a method as any, and I believe the safest, is, to beat up the whites of eggs to an oil, and then to smear over the eggs you intend to preserve with a camel's hair brush dipped in this liquor. Take care that they are entirely covered with this varnish, and I am credibly informed it will keep them fresh above a twelvemonth.

^c Semper autem, cum supponuntur ova, considerari debet ut luna crescente à decima usque ad quintam decimam id fiat; nam & ipsa suppositio per hos fere dies est commodissima, & sic admittendum est, ut rursus cum excluduntur pulli, luna crescat, diebus quibus animantur ova, & in speciem volucram confirmantur. Columella, lib. 8. fol. 188.

advantage,

advantage, says he, to the increase of the chickens in the eggs, but by this means it will so fall out, that the chickens will be hatched also when the moon is increasing, which will be a great benefit to them.

When a hen is ready to sit it may be found by the feathering her nest, for she then begins to pull off the feathers from her breast, and to make her bed ; and before she is ready to sit, if you would have her sit in the place you desire, it is good to confine her to that place before she has laid all her eggs, that by laying an egg or two there, she may be reconciled to it ; for, if her laying be out, and she has chosen another place, it will be hard to get her to sit to what place you desire ; and it is better to let her sit in the worst of places she shall choose, than to remove her from the place she has once chosen. Columella directs to increase the number of eggs you put under hens as the weather grows warmer. fol. 187.

I find Pliny, Varro, &c. order, that the number of eggs you set under hens should be odd, without assigning the reason for it ; but Markham, fol. 112. says, the eggs will lie the rounder, closer, and in even-er proportion together.

§ 5. Many of our turkey-eggs and goose-eggs Of setting geese and turkeys. See §. 13. proved addled this year (1706) so that we had very ill-luck in hatching our feather'd fowl ; a maid, who came just after our ill-luck, said the reason must be, because we still took away the eggs from the hens as soon as they layed them, whereas, if their eggs had been left, their desire of sitting had increased, and they would have sat sooner ; therefore her mistress did let the eggs alone : note, it will be good therefore to pen up the hens soon after their laying is over, and make their nests and put eggs into them.

§. 6. Chickens do better, and thrive much the Of breed- ing chick-ens. faster for running about with the hen, not being cooped

cooped up, for the hen having her liberty, scratches up emmets, bugs, and worms, more agreeable food than we can give them; but the hen, having been cooped up, is very wild when set free, and rambles at a strange rate, to the loss of her chickens, nor makes she, when set free, a tender mother.

Of rearing
chickens in
winter.

§. 7. The princess's poulterer assured me, that rearing early chickens by a kitchen-fire, as poor people did, was by no means a good way, for it was not a natural warmth to them, and their flesh would not eat well; that straw and the warmth of the hen, but especially good meat in their bellies, was the best means to support them in cold weather: for outward warmth signifies nothing, if there be not a good vital substance; and, said he, in feeding little turkeys and chickens, you will find by experience they will feed better and thrive faster by pecking off of your finger than from the ground; barley-meal is the heartiest and best food for them, and cheese-curd a very hard food, that nourishes not nor heartens, and therefore it is a great mistake in housewives who give it.

Vetches
not good
for chickens.

§. 8. Farmers agree, that at the time of threshing their vetches, it is common to have the chickens, almost as big as the old ones, die, being not able to digest the vetches, which swell in their crops; and even the biggest poultry will be sick with it.

Of a pul-
let with
egg.

§. 9. A pullet with egg is accounted very good meat, but then I conceive it is about the beginning of February, when they are but young with egg: for on their first being with young all creatures thrive, but the embryo growing big it preys on the mother, and draws the moisture and nourishment from her, which is the case of the pullets at this time of the year, viz. the beginning of March.

Of geese.

§. 10. Mr. Cowslade of Woodhay tells me, notwithstanding the objection to geese on their tainting the

the grass, they are a great good to cattle, where lands are subject to murrain; he says the common of Emburn is the same sort of land as that of Woodhay, but in the court-leet at Emburn, such are presented as put geese in the common: yet the Wood-hay people take the liberty, and it is observed, where one beast dies of the murrain at Woodhay, ten die of it at Emburn. Salmon's dispensatory says, goose-dung is excellent against the green-sickness, scurvy, jaundice, dropsy, and gout.

Pliny says of the goose, they tread in the water; and Worlidge says, it is observed of geese, that in case the waters are frozen up (as in some hard winters they are) about their treading-time, then the most part of their eggs will prove addled; the reason is said to be, because the goose proves more fruitful when she is trod by the gander in the water than if upon the land. fol. 175. Quære how it fares with those, who keep geese where no water is, or where the ponds prove dry in treading-time.

Young geese will never fat well when they are breeding their young feathers, for their feathers take off from their nourishment.

§. 11. Of geese, Columella says, you should allow ^{Three} a gander to three geese; for they are too heavy to ^{geese to a} serve more ^{gander.}.

§. 12. The older the goose, the sooner they lay, ^{Old geese} for which reason an old goose is more profitable in ^{breed ear-} bringing earlier goslings, which yield the more money. Some say, if the goose be two years old it is as well as if more, but ducks will breed as well at one year old.

§. 13. Geese love not to sit but upon their own ^{Of setting} eggs, at least the better part must be their own; if ^{geese. See} §. 5.

* Singulis maribus ternas foeminas destina; nam propter gravitatem plures inire non possunt. Colum. fol. 193. & Palladius; fol. 59.

you take them from them at first, as they lay them, they will lay even to an hundred, till such time as their fundaments stand gaping open, not being able to shut them, by their own laying. *Maison rustique*, fol. 107.

Of pen-
ning geese
and ducks
at night.

§. 14. I asked a notable dame why she penned up the ducks and geese, and the ducklings and goslings at night; she said it was, in the first place, because these last were young, and for fear the hogs should meet with them, and eat them: I asked her why there was not the same danger by day; she said, there was some danger, but not so much, the old one keeps them then, for the most part, in the water, and when they are penned up they are more secure from the fote: said she, we pen up the geese and goslings much, by day, when young, because the goose is not so careful as the duck of her young ones, but will keep with the gander and flock, and run up and down with them, insomuch that the young ones, in following them, will frequently fall down dead on the spot: but the duck will keep with the young ones, without regard of the other ducks. I asked another dame of these things next day, and she agreed to it, and added, that, if pigs once took to eat up ducklings and goslings, they would never give over till they had eat up old ducks, and geese, and gander; the sows particularly, if kept hungry, were very subject to it.

Ducks.

§. 15. Ducks, I am informed, generally lay in the night, wherefore a careful dame drives them then into a lower coop, and feels every one of them, in the morning during their laying time, to see whether they have laid that night, or whether they are full of egg ready to lay, if so, she keeps those in; if she takes not this method, they lay about in so many holes, that she is apt to lose their eggs.

I was saying to a certain dame, that I thought there

there was little profit in ducks and geese, for several reasons, that there was little they could feed on, but what the hogs did and could find out ; she replied, that ducks, whilst pigs feed on corn, would follow the pigs, and live very well on their dung ; I asked whether it was so with geese ; she said, she had not observed them to do it.

§. 16. This day (April the 24th) my servant was wondering to a dame in my neighbourhood that my ducks were not for sitting, notwithstanding they had ^{Of ducks sitting.} layed out their laying of eggs ; the dame replied, that was no wonder, for she did not expect her own ducks should sit under a month yet ; for, said she, ducks have two layings of eggs, and do not sit to hatch till the last, which is about the middle of May ; if you will, said she, have early broodlings of ducks, you must set the first layings under hens. Neither the *Rei rusticæ scriptores*, nor *Worlidge* speak of this. — Note, (April the 12th, 1707) this day I have two ducks that have been sitting this fortnight, but this is not very common.

§. 17. *Columella* advises to put aftermas hay ^{Of fattening poultry.} under fattening-poultry in their coops, for if they have a hard bed they will not easily grow fat ; and to keep them in a warm, close, and dark place, that they may move as little as possible, for cold and motion are a great hindrance to their fattening.

§. 18. In cramming turkeys and chickens, said ^{Of cramming.} the princess's poulterer, be sure you give them time to swallow before you give them more ; for, if you cram it down too fast, they will not thrive with their meat : he said further, that the prime season for a pullet is before she has laid, or a week after, for after that time the straining herself has so weakened her, that she pines, and her flesh eats not well.

§. 19. In poultry, if you keep long in the same ^{Poultry degenerate.} strain,

P I G E O N S.

strain, the young ones will degenerate, and oftentimes die before they come to maturity; it is the same with pigs and calves.

P I G E O N S.

Of the pigeon-house.

§. 1. **I**N pigeon-houses, many build a lower window in the wall under the eaves, to open and shut at discretion, to let the young pigeons of every latter breed (which are weakest) out the sooner, they being not strong enough to rise upright through the well of the house.

Some say, there ought to be double the number of holes at least, as you have hen-pigeons, besides what are to be allotted for the cock; because the hen-pigeon, whilst she has young ones in one hole, will be building and sitting in another.

It is a great doubt whether it is beneficial to a pigeon-house, to keep the holes clean from the dung and trumpery.

Varro * calls the pigeon a very cleanly bird, and advises to sweep the dove-house, and clean out the filth frequently all the year round; for the neater it is kept the livelier the bird, adds Columella; the whole place, says he, and even the holes, ought to be white-washed, the pigeon being particularly fond of that colour.—The Roman epicures had a custom of breaking the legs of the young pigeons, that, not being able to move, they might fat the better.

* Varro (lib. 3. *de re rustica*, fol. 70.) says, *permundæ sunt enim hæ volucres, itaque pastorem columbaria quotquot mensibus crebro oportet evertere.* Columella ait (lib. 8. fol. 190) *totus autem locus, & ipsæ columbarum cellæ poliri debent albo testorio, quandoquidem eo colore præcipuè delectatur hoc genus avium.* Pulli fractis cruribus citius pinguecunt, nam fracta crura non plus quam bidui, aut ad summum tridui dolorem afferunt, & spem tollunt evagandi. ib.

Nam quanto est cultior, tanto lætior avis conspicitur. Columella, fol. 190.

Didymus

Didymus directs us to hang up sprigs of rue at the entrance, and in many places of the dove-house, which, he says, is good to drive away vermin. The old authors agree in the same thing in regard to hen-houses.

§. 2. It has been a question with many, if dove-house pigeons pair or not, and keep true to their plighted love, which it seems to me they must do, because we often find in their hole a pair of eggs and a pair of hatched pigeons near fledged, which eggs are soon after hatched also, which could not well be, unless the cock fed the young ones whilst the hen sat. Of pigeons pairing.

§. 3. We had no rain all April and May, and had never so poor pigeons in that season; the reason seems to be, because the corn in the fields was dry, there having been no rain to moisten it: for young birds must have what is tender of digestion, and so we treat all sorts of poultry. Dry weather bad for the breed.

§. 4. Towards the end of the month of June, in the pigeons benetting time, I entered my pigeon-house to see, in case there were any young ones, what seeds they had in their crops: I took half a dozen young ones; besides what corn they could here and there pick up, I found much charlock-feed, and the seeds of the common creeping crow-foot or butter-cups (in their crops) which is a small, flat, and sharp-pointed seed, (vid. Ray, fol. 581.) and afterwards did observe great flocks of pigeons to light in the fields, where that plant grew plentifully, at the time of it's feeding. Of their feeding on the seeds of weeds.

July the 19th I had a pigeon killed in the field, and opened his crop, which was full of the before-

^b In fenestris & ostiis aliisque pluribus columbarii locis, rutæ ramulos deponito, & suspende; habet enim ruta naturalem quandam contritatem ad bestias. In Geoponicis ex Didymo, fol. 773. lib. 14.

mentioned butter-cup seeds, and fumitory-seeds, and nothing else, saving half a dozen bud-flowers of charlock, and two or three oats; I observed they were very voracious of these seeds; for I had three acres of arable, which had laid down to grass two years, and that had more butter-cups in it possibly than my whole farm besides, in which my whole flight of pigeons lay all day, and in a piece of wheat near my house, which had much fumitory in it; you may see, where these plants grow in fields near pigeons, the seeds picked off: they are therefore of great use in ridding the fields of weeds.

Of feeding
pigeons.

§. 5. It is not to be doubted, if you in winter feed your pigeons, but others from other dove-houses will come to the table in your dove-house, by observing them sleek, and in good liking, or by smelling the sort and plenty of food they have in their crops, as well as is elsewhere noted of rabbits.

Water ne-
cessary
near a
dove-house

§. 6. A pigeon-house will not thrive unless very near water; not but the pigeons can go far for water for themselves, but their returns must be very frequent and quick for their young ones, who are wanting much water, and by carrying it far it will be dried up in their crops before they can bring it to their young.

B E E S.

Of bees in
general.

§. 1. **W**HATEVER you do to bees must be in the morning, and not at night by a light; for every bee that is disturbed and strikes against the light, is lost and chilled by lying out.

The honey-bee never draws it's honey from the broad clover, for it's proboscis is not long enough; it is the humble bee that feeds on that. The best provision for bees early against the spring, is by sowing turnips in August, which will flower in the spring,
from

from whence the bees extract abundance of honey : they draw abundance of honey also from the vetch-blossoms, but never lie on the pea.

A south-westerly exposition is better than a south-easterly ; for the south-easterly calls the bees out too early in the morning, and in a south-westerly they will work an hour later at night. If a hive will not swarm, so that you are forced to raise the hive, you must be sure, before winter, to take the prop from under the hive, and though they have worked down into the prop, the combs must be cut away, that the bees may lie closer and warmer, for the reason why a smart comes to nothing, is, because they are too few in the hive.

§. 2. This day (September the 15th) I could not but recollect what Pliny says of flies, that they breathe not from their mouths, but from porous parts of their bodies, in which opinion I was confirmed ; for a bee had fallen into my garden pond, and was labouring at the oar to get out ; I wondered to see, from the sides of his body, divers quick curling streams on the surface of the water, which extended two inches long from each side of the bee, and each stream was distinguished and divided from the other like the points of a compass ; I saw plainly this could not be from his legs, and his wings laboured but little ; I was satisfied these streams proceeded from the porous portals his labouring breath came out at, which issuing with force (for otherwise it could not have made so long streams) may give some account, how the vibration of his wings on those portals makes his wind-music, and plays thereon as we do on a flagelet. Their manner of breathing.

§. 3. The 16th of Jannary was a still fine frost ; Of hives. and at noon it was fine and warm in the sunshine ; I observed it to invite many bees out of my hive, especially out of my boxen-hive, which stood under my straw-

straw-hive, and in the sunshine I saw them play; I saw here and there one fly out of another straw-hive, but very few; the next day I told between twenty and thirty that lay dead on the ground under the hive, and at the hive door, with a hoar-frost of the night covering them; note, the entry-hole of this hive was very open, wherefore I do infer that such entry-hole, being large, lets not only the cold and wind in, to their prejudice, but the sunshine of the winter to their utter ruin: I do infer likewise that these boarded hives are not so warm in winter to resist the cold, nor so able to resist the sun either in summer or winter, as the straw-hives, because the heat and cold cannot penetrate, where the particles of each injected have their powers broken by such a numerous body of twisted straws, between each of which there is a sort of vacuity, which must needs make the frost and sun break their lines; whereas timber being porous, and yet a continued body, the heat and cold passes through it without interruption; so that, I believe, the sun has too immediate an influence on the bees in those boxen-hives to their great prejudice, both at spring and winter.

Mice and
moths per-
nicious.

§. 4. Mr. Cherry's gardener of Shotbroke had put, during the winter, a piece of slit trencher before the bee holes, with two little arched holes cut in them, to let the bees just have room to pass in and out; I thought it had been for warmth, but he said it was to keep out the mice, which would soon, in the winter, destroy a hive: he said the moths were likewise very pernicious to bees; for they would get into the hives towards the latter end of summer, and at the bottom of the hive, about the edges of it, lay their eggs, which at the latter end of spring come to great maggots, and crawl up and down the hive from comb to comb, sucking the

the honey; thus, he says, he has known five or six hives, in a season, destroyed by them; his way is to lift up the hives, and examine them, after Michaelmas, and destroy such eggs; he says, the mice get not into the hives all the summer long; for then the bees are strong and lie before the hole all night, and will not let them come in,

H A Y.

§. 1. **I** Was taking notice that some hay my servant had bought for me had lost it's smell, which could not be from the rain; for none fell that year in the hay-making time, but it had laid abroad in the dew without being made into cock: and this is frequently the case of hay below our hill; for below the hill after it is laid in swarth and tadded, that is, scattered abroad, they do not cock it till they cock it for good and all; whereas in the hill-country they cock it the same day it is tadded, if it be a hot day. Of making hay.

§. 2. If you will make aftermas broad-clover, **I** hold it best not to let it lie one night in swarth, but against every night to cock it in large cocks to secure it from the dews, which, at that time of the year, fall very largely; for the dews soke into the broad-clover, and thin the spirity juice, and thereby make it volatile and easily exhausted by the sun; whereas if the spirity juice, which is of consistency, be not thinned by the water getting into it, the sun will fix it, by drawing out the watery part from it; but if it be thinned by adventitious water, by reason of such thinness of the body, it will evaporate; it is true, by laying it in swarth night after night, it will sooner be hay, but then the hay will be spoiled; for the dryness of the body proceeds from the Making broad clover hay.

Z

above

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above precipitate manner of exhausting the spirituous juice by letting in the water. ^a

Great burnet hay.

§. 3. They count the great-burnet hay in Leicestershire, the best sheep-hay, and the best horse-hay.

Hay better in a reek than barn.

§. 4. I was saying, at the appraisement of the hay in Sir Ambrose Phillipps's great barn, at which I was present, that I would not make use of that barn for my hay, unless the season of hay-making was wet, but put it without door in a reek; to which the keeper replied, that he owned hay came better out of a reek than a barn, and that hay reeked abroad required much less making, having a passage for the air and wind to qualify it.

I was proposing to set up a ^breek-house for hay in my meads; several of my oldest and most experienced labourers seemed to be against it, but I could not have a reason, only they said, hay never came so well out of a reek-house as out of a reek, and one of them said, the reason was, it never lay so close; the timber posts, bearing against the hay, kept it from sinking close, and so it lay too hollow; I replied, that then in making the reek, room of a foot space within the timbers should be allowed it for sinking, which caution, I take it, should be always used in such cases.

Of making a cock.

§. 5. In making hay-cocks it is of great consequence to see that the cocks are made with a narrow bottom, and round head; for where they are made with a broad bottom and sharp top, pyramidwise, the cock sinks flat, and squats down, and lies so wide, and broad, that rain damages it greatly, whereas a round top with a narrow bottom will save the cock from rain.

^a For making St. Foin or French-grass hay, see note extracted from Mr. Tull, under the article Grasses, §. 50.

^b Dutch barns had not been introduced, or were but little known in our author's time.

In making hay-cocks, in order to be carted, I find by experience, that they ought to be made large (from a dozen to fifteen to a load, which they ought not to exceed) because the fewer make a load, the sooner they are loaded, and the greater is the dispatch, and, if they are set out in rows it is the better; less time is lost in going from cock to cock; the more hay-cocks you make, the more bottoms, and, in proportion to the hay, more lies on the ground, and consequently, if the season be wet, it is by lying long on the earth liable to more damage; a little cock, is apter to fall flat, and, if rainy weather comes, what with the bottoms and tops, it all takes wet, there being little in the middle; again, being light of weight it cannot compress itself close, but is hollow, and so takes in the rain, and, if you cart in the dew, or when the ground is wet, there is more hay spoiled by raking in the wet, where are many small cocks, than where a few great ones.

§. 6. It seems fit to be considered in the buying ^{Of it's} a hay-reck, how far the hay-reck may have heated ^{sweating} when it was made, for, if it heated well, provided it be not too much, the hay will yield more loads, because in sweating it falls so much the more close; whereas, if the hay was put up over-ripe, it will not so well answer expectations in the quantity, it lying so much the hollower.

§. 7. An ancient experienced farmer tells me, he ^{Of old} always found old hay as good for cattle, till the lat- ^{and new} ter end of the year, as new; but then it grew too dry ^{hay.} for them.

§. 8. We found it manifest this year, in hay-mak- ^{Short hay} ing, that short hay of the same bulk out-weighed ^{weighs} long hay abundantly. ^{best.}

W O O L.

Growth on
the sheep's
back.
• See
mowing.

§. 1. **O**NE of my labourers in * mowing complained of the old rowet that choaked up the scythe, and compared it to the young wool, which, when sheep have been pretty well kept in the winter, and then checked in the spring, comes up under the first wool, and deadens the sheers, so that it is troublesome to cut.

I immediately went to another, who I knew had been a shepherd, and had sheared much, and inquired of him concerning such wool; he said, it was true, that, if sheep are kept well at the forehand of the year, and have a check in the spring, and then comes a flush of grass on the first rains, their winter wool will grow no more, but a young wool will arise, and cast off the old wool, so that one may almost wipe it off with one's hands; now if the young wool is not grown so long, but that the shears slide over it, or between the young and old, then it is not troublesome to shear; but if it be grown so long that the shears must cut it, then it choaks up the shears, and makes it troublesome; and in drawing the wool out with one's finger and thumb, to see the fineness of the thread, it will part.

When
wool
grows fast-
est.

§. 2. I sold my wool to a fell-monger, and we happened to fall into an argument what time of the year wool grew fastest on the sheep's back; he said, it grew fastest that quarter of the year which was between Christmas and Lady-day; I wondered at that, because it was the coldest quarter of the year; but he answered me, it did grow faster then, than from Lady-day to the 17th of June, which was the day I sheared, for, said he, the wool stops in growth long before that, and begins to loosen from its root, and a new wool growing thrusts it out.

This

This put me in mind that the fleeces in the eastern counties might be easier plucked, and with less pain to the sheep than we imagine, if they nick the time in doing it, when the wool loosens from the skin of the sheep.

§. 3. May the 19th farmers Box, the father and son, and farmer Isles, farmer Stephens, and young farmer Sartain of Wilts, all agreed, that wool grew faster on the sheep in dry than wet summers (for from the growth of the sheep the wool depends) and that all sorts of cattle fatted then faster, and grew faster than in wet summers, if they had meat tolerably sufficient; for continual wet outwardly on their coats washes them out, as well as inwardly, and then the grasses are sourer also; besides cattle have more hours for eating in dry than in rainy weather.

Wool on the sheep affected by the weather.

§. 4. There is a particular sort of sheep in Persia of which they are very choice, their wool is as soft as silk, and I am well informed, that to preserve the beauty of it, and keep it to a good curl, they swathe their sheep.

Of swathing sheep in Persia.

§. 5. When a sheep's wool peels away under his belly, the shepherds say, it is, most generally, a sign of an old sheep; not but that a young sheep will be sometimes subject to it: that which will best prevent the like another year, if young, is to keep him up in case.

Of wool peeling off the sheep.

The ewes that lamb about Lady-day, will have their lambs, by the quickness of the grass at that time, so brisk and forward, that with sucking and butting they will have beat all the wool bare from the ewes' belly by the time they come to be sheared.

§. 6. Mr. Methwin and Mr. Holliday, clothiers, say the Spanish wool is not near so fine and so good of late years, not above half so fine as it was formerly; the finest, they say, comes from Segovia in Spain; the same they say of Herefordshire wool.

Of Spanish wool.

Fine feed
makes fine
wool.

§. 7. Tho' one farm and another is said to have better and worse wool, yet the rule is very uncertain ; it is according to what sort of sheep a farm keeps, which may occasion a great alteration in it, for ewes carry finer wool than weathers and hogs ; again, the wool is improved according to what grass one gives the sheep, clover-grasses raising a coarser wool ; again, it depends on what sort of hay the sheep have at winter ; the better the hay the finer the wool ; and hill-country hay, if one has enough of it, will bring finer wool than the next farmer shall have, who buys a vale hay.

If sheep are abused in their keeping so as to pitch, their wool, tho' never so short, will handle hard and rough, be curled, and not run into a strait thread, and break off in combing.

Short grass
best for the
wool.

§. 8. At Bishops-Cannons and all the Cannons, where the wool is so fine, and the land so good, they keep their feeding as close as may be ; for they count, amongst them, the shorter the sheep's pasture the sweeter ; if so, it must be more so with us, where the ground is poor and sour. The wool from Woodcote-farm, which is contiguous to me, will out-sell that from Crux-Easton, because their sheep feed on the downs, and ours on the corn-lease.

Fallows
produce
good wool.

§. 9. In Isbrants Ides History of his embassy from Muscovy to China, printed 1706, he says, so, 189. the mulberry-trees in China are managed in a manner different from all other countries ; for they are kept low, and annually lopped, as the vineyards are ; because, says he, the young shoots occasion the production of the best silk ; and indeed the difference between the silk produced by those worms which feed on the first leaves, and that of the latter growth, when they are much harder, is very considerable. — I note this, because I have made a remark before, how the best wool proceeds from grass growing on fallows,

fallows, which proceed from a seed of the same summer, and there seems to be a great affinity between wool and silk.

§. 10. Burn-beaking the downs will be a great prejudice to the staple of wool; for, though the bulk of wool may come off the vale, yet it is most born and bred on the downs, from whence the vale-men buy their sheep, or otherwise they would not have so good wool; and though particular parts of the vale, as all Cannons, &c. produce a fine wool, yet the reason of that is before given.

Burn-beaking prejudicial to the wool.

§. 11. Mr. Bishop's shepherd of Dorsetshire said, the older sheep grew, the finer was their wool, and the least of it.

Wool of old sheep finest.

§. 12. Where the ewe-wool is dearest, the lamb-wool is cheapest; for the ewe-wool sells for it's fineness, but the lamb's wool for it's length.

Of ewe and lamb's wool.

§. 13. Mr. Bell of Marlborough, coming to buy my wool, asked me whether I sheared my lambs at Midsummer, as I did my other sheep; I told him yes; because, said he, many will shear their lambs a month after; for the wool is so much the better for being the longer, the ewe's wool the shorter the better, the lamb's wool the longer: I asked how much it might yield the more for being a month's growth the older; he said, a penny perhaps in the pound: I answered, twice shearing made two troubles and charges, and I know not whether it would turn to account.

Of lamb's wool.

I told my shepherd what Mr. Bell said about shearing the lambs early; and he replied, if the lambs were late shorn, they would not at Michaelmas carry so good a body and look so full, nor carry so good a price; some shear them so shallow as to leave a good coat behind, because they may look more burley at a fair. — Quære therefore, if I should not shear those later which I keep myself — Asking my shepherd this question afterwards, he said, it would be two troubles

both in washing and shearing, and chargeable, more than the profit on the wool would come to, and the sooner we sheared our lambs, the more wool they would have when they were sheep.

Wool of
colley-
sheep.

§. 14. I asked Mr. Townsend and Mr. Fry, clothiers, the reason why Hertfordshire wool should be the worst in England; they said it was certainly so, and that they affected the sort of sheep they had, as a very large sheep, which, said they, are of the colley sort, that is, black faces and legs, and their wool is very harsh, mixed with hairs, like dog's hair, and not so white as ours.

Black
wool.

§. 15. Stevens of Pomeroy in Wilts, desired to have two or three fleeces of my black wool, and made no scruple to give me nine pence per pound for it, though he was loath to give so much for the white fleeces; for, said he, the black fleeces are of more value than the white, and he gave this reason; in the making a dark coloured medley druggert, or cloth, the thread of the white being twisted with the black will effect it without being dyed, and will make much the stronger cloth, in as much as all dyes that dye a dark colour do much rot the worsted: but the dyes of light colours, being only a light staining of them, do not so much hurt the wool.

Curled
wool.

§. 16. When the wool-man was weighing my wool, he shewed me the difference of some fleeces in goodness, and particularly the locks of some fleeces that were curled, and said, such wool was not, by a penny in a pound, so fine, as that which was soft and strait, nor would such wool lie fine and smooth in the druggerts.

Goodness
of wool.

§. 17. I was arguing with my wool-man on the qualities of wool, and insisted that, though they judged according to the fineness of the thread of wool, yet wool of the same fineness might be much better than other wool, because the proof and strength

strength of the thread in one sort of wool, might be better than in another of the same fineness, by reason of better food, being never pinched summer or winter, and consequently having proof to the very end of the hair : he said, that wool impoverished by ill-feeding or starving, at any time of the year, was plainly discernable ; for it would run off thin towards the ends of the hairs more than suits with a taper figure. I suppose the change towards the end is discernable as in corn and grass, when it withers at the top : he allowed my wool was better than my neighbours, for my not pinching them any time of the year.

§. 18. A great dealer in wool assures me, that wool of sixteen shillings in the tod is eighteen pence in the tod worse in goodness when three years old ; for then it grows starkey and dry, and will not lie smooth in the spinning ; for the oil of wool wastes very much after two years old.

§. 19. I was with Mr. Anthony Methwin, a ^{Edge-}great clothier, and entered into discourse with him ^{grown} of wool ; the edge-grown wool, I spoke to him of, he assured me, was the worst abuse the woolmen put upon the clothiers, for the young wool of it was all to be flung away, because it could not be worked up in cloth ; he said, wool that pitched, by reason of the sheep's poverty, would tear and break in pieces, and great waste was made of it, that wool managed as I manage mine, was much the better in all respects, and more profitable to the clothier to buy, and though it might run a little longer for it, would be extraordinary good for cloathing : he agreed with me, that fallows always produced better wool than the very same ground when laid down to grass, and said, the longer a ground laid to grass, and the older the grass was, it was the ranker food, and the wool coarser, for which reason

son the fallows having new young grafs in them, produce so much the finer wool; he did, for the same reason, assent, that the hop-clover generally speaking (especially in clay-land) might produce a finer wool than it's natural grafs; that the thicker and clofer wool handled, and straiter in it's threads, and not curled, it was the finer, and laid smother in the piece of cloth: That wool, added he, in the sheep, that hangs least under the droppings of the other, is the finest, such as the neck and breast and belly.

Of the
pitching-
mark in
wool.

§. 20. I find the pitch-mark, if it be not worn out before shearing-time, the wool-men do not like, because, say they, we have no help but to cut it off, whereas, tho' the ruddle, if the sheep be much ruddled, weighs to our loss, yet that washes out.

Of binding
wool, and
of it's
growing.

§. 21. Wool intreaseth by lying by, and, if put up hollow, will in two or three years feel very close, and be intangled, which is occasioned by, it's growing; but it will not grow till after it's sweating is over, which is not till Michaelmas.

It is generally agreed, that wool, being bound up very close, so that the wind cannot get into it, will pay interest in growth till towards the next spring, but should be sold before the March following, lest the winds of that month should dry it too fast.

Of the
wool-lost.

§. 22. The wool-man having bought my wool, and coming to weigh it, assured me, that by the tumbling and removing the wool, and letting in the air to it in the carriage, it would lose in weight, a pound in the tod, before he got it home: from hence it follows, that to move your wool in the loft, or from one room to another is loss, or to tumble it up and down in search of mice.

Time for
selling.

§. 23. When wool-men buy not at the first hand, when the wool is sheared, they care not to buy in the winter; for the damp and foggy air gets
into

into the wool in winter, which makes it weigh heavier; therefore the chapman chooses not to meddle with it till spring.

§. 24. I find, by Mr. Brewer, Mr. Methwin, and many more clothiers I conversed with in Wiltshire, that the wool-breakers do, in the first place, separate the fleeces by themselves that run most of a sort. Of the several parts of the fleece.

Then they sort the different kinds of wool in each fleece by itself, which fleece is never divided into less than four parcels, viz. — The tail-wool is laid aside for lifts for cloth, rugs and blankets. — Half the buttock towards the flank is for the long woofed thread, in serges and druggets, which they call the woofed, and runs the length of the serge or drugget, which, tho' spun to a finer thread, yet is harder than the abb which crosses the woofed thread, and runs the breadth, yet is of a coarser wool: but Mr. Merryman, clothier of Newbury, denies that any of the buttock is fine enough for the woofed thread: — What is on the back and ribs is somewhat finer, and makes, in druggets, the thread called abb; which runs cross the chain, called the woofed, and is of a finer wool than the buttock, and twisted in the thread looser. — The neck, and breast, and bottom of the belly, make the thread which in the finest cloth is the chain called the warp in cloth, which answers to the chain or woofed thread in druggets; but the abb in cloth which answers to the abb in druggets, is all made of Spanish wool, which, being finer, will come closer together, and the finer it is made, tho' the thinner, yet will keep out rain the better: but Mr. Merryman of Newbury, clothier, will not believe the neck and breast fine enough for the chain.

H I D E S.

Of the quality of hides.

§. 1. ACCORDING as the beasts were in proof, in flesh and fatness, proportionable is the value of the hides, and such will be the proof of them under the hands of the tanner; for example, as young meat and fat meat plims and increases in the roasting and boiling, but lean and old shrinks, so a hide of a young and fat beast swells and thickens in the tan-pit, and yields a proportionable increase according as the beast is young and fat; but the hide of a lean and old beast shrinks and loses it's substance in the tan-pit, and will not take the tan as a young hide: therefore a murrain hide is of small value, unless it be the back part, to make a pair of boots, to which purpose it is useful, on account of it's shrinking and closing of the pores; the very best of the hides are bought by the bridle-makers, because they are required to be of the best substance: the value of a hide is known by it's weight, by lifting it with the hand, as it weighs heavier or lighter in proportion to it's largeness or smallness, nothing being a greater commendation of a hide, than to weigh much heavier than one would expect from the size of it.

The north-country hides are the best, and thickest, and generally handle best, the reason whereof probably is, because their feed is deepest, and they are maintained always in good keeping, and never pinched.

It is generally agreed, the finer the hide the sweeter the meat of a beast.

Of sheep-skins.

§. 2. The skins of the sheep thicken much, after they are shorn: in some time after they will grow as thick again as before. I judge this must proceed from

from the cold, and puts me in mind, that the hides of all cattle are thicker grained in the hill-country than in the vale, as also of the story (which, as I remember, Herodotus tells) of the Persians and Greeks, that when they were, on both sides, slain in a battle and stripped, the nations were not to be distinguished but by their skulls; for the Persians wearing always turbans on their heads, which kept them very hot, their skulls were much the softer, and would yield to the impression.

RISE and FALL of MARKETS,
and their CAUSES.

§. 1. **G**ENERALLY speaking, the ear-^{Of buying}
lier a thing is bought, when the mar-^{early.}
ket is open, it is bought the cheaper, for though afterwards many contingencies may have an influence, yet the general condition of mankind, who are not provided with money to buy as early as their occasions want it, or want to sell before there is a general demand for goods, must favour the ready-monied man, who is provided beforehand; thus, for example, they, who at spring of the year first buy barren beasts to fat, or sheep, have the advantage; for they, who sell earliest, either want the money, or winter-provisions, as hay and straw, to maintain them till the grass grows; which is a general case of too many; and they, who buy early, do it because they have money before the generality have it for such purposes, or a remaining surplus of hay, or straw, more than the stock of their farm can spend, which is the case of few, so at such times there must be regularly more sellers than buyers.

§. 2. In the summer 1702, there was a great
scarcity of hay and grass, for which reason beasts
^{Plenty of one kind of provisions were affects all others.}

366 RISE and FALL of MARKETS, &c.

were not fatted in so great a number as usually; consequently the breed in England of beasts increased; this year, 1703, there was much grass and hay, abundance of beasts therefore were fatted, which made beef cheap; and fat mutton, by reason of a bane, was cheap; and seeing beef and mutton was to be had cheap, people would give but a low price for cheese and bacon: so that any one kind of food being cheap, is apt to lower the price of all other sorts.

Scarcity of
beef makes
lamb, &c.
dear.

§. 3. From the exceeding last year's hot summer, 1719, whereby fewer beasts were fatted, and hay very scarce the spring following, beef yielded five pence per pound; this made fat lamb sell exceeding dear, not only at spring but all along June and July; the reason is plain; because there must be a great many fat lambs go to make up the failure of each ox's fatting, and meat must be had.

Sheep and
wheat
cheap about
September.

§. 4. On the 16th of September wheat was sinking, and about this time of the year wheat generally falls in price, for the farmers, who live in the pasture and turnip-countries, do about this time of the year, tumble out their wheat in the markets, and glut them, in order to raise money to buy sheep at Weyhill, and the sheep-markets, as well as to pay harvesting, and for feeding their ground with wheat.

Wheat sunk for a few markets, and sheep, notwithstanding it was a great autumn afterwards for grass, and a great turnip year; the reason of it was, that money must be raised by most farmers out of the produce of their farm at this time of the year (September) to answer their many occasions, and they, observing wheat to sink, thought fit to lessen their winter stock of sheep, and keep their wheat, because hay, through the wet, was generally damaged, and not great in quantity, and so the main-
tainance

tainance of sheep was like to be chargeable; and consequently such sale out of the capital must glut the market and sink the price.

§. 5. From the 24th of September to the 20th of October, 1704, the land was so dry, the farmers stopped ploughing for, and sowing of wheat: Mr. Raymond, and Mr. John Horton of Wiltshire, came to me in a visit, and I was saying to them, surely if this weather held a week longer it would make wheat rise; no, said they, at such a time it sinks in present, because the farmers send their wheat to market, which they would have sowed, but the next year it will be dear: it is the same case as in a rot of sheep, every one having sheep to sell, for the present they are cheaper.

§. 6. Generally it may be foreseen and concluded, that, when the harvest falls pretty late, seed-wheat, of the old year and of the new, will hold dearer, in the hill-countty (in proportion to the following price of wheat when the markets open) than when the harvest comes on early and quick; the reason is, because, when the harvest falls out late, farmers sow much, in those countries, of old wheat, because they sow early, which goes a great way in the consumption of the stock at the latter end of the year (i. e. September); also, when harvests fall out late, the farmers can raise money soon from barley, oats, and peas, because by October those grains are vendible, and so they are not forced to sell wheat so soon, to raise money by that grain alone, to discharge the harvest wages; but when harvest comes early, old seed-wheat may probably sink in price, vice versa.

§. 7. The nearer the market is to London, the worse the market is, if wheat be cold or grown.

§. 8. From harvest time through the winter (1705) barley was three shillings in the quarter dearer, near Salisbury, Devizes, and the inland towns, London market. Prices of barley.

Of the rise and fall of corn.

Prices of seed-wheat

Cold or grown corn unfit for London market. Prices of barley.

towns, than at Newbury, Reading, and those countries that drove the London trade of malting; the reason was, the great stock of barley, the traders in malt to London had provided the year before, had glutted the London market, whereas the malsters in the inland trade do not provide great quantities beforehand, and therefore, the crops of barley miserably failing this hot summer, barley bore a better price with them than with us.

Bane in
sheep
makes corn
dear.

§. 9. I was observing to Mr. Hawkins, the great Hampshire farmer, it was a saying in this country, that if corn was dear sheep would be dear, and vice versa; he said, the foundation was in the sheep and not in the corn, for, if a bane fell on sheep they would be dear, and, if a bane fell on sheep, corn would be dear, because there could not be a fifth part of the folding that otherwise there would be, and consequently a deficiency of the crop, and therefore dear; but if no bane, and a great breed of sheep, corn would, on the other hand, be plenty.

I add to this, that by a bane year of sheep, it may generally be taken for a rule, wheat will be made dear, because in baning years it is a wet spring; but a baned year makes, for the present, beef and mutton cheap, because such abundance of mutton must be killed, before the bane be too far gone in the fat sheep, but the rot makes both afterwards dearer: the dearest time for mutton and beef is Lent, though it is scarce also the latter end of March and April, but then the plenty of lamb and veal keeps the price from rising.

A bane or
rot makes
ewes sell
well.
Scarcity of
hay makes
lambs sell
well.

§. 10. When there has been a rot of sheep, it may be reasonably expected that ewes will sell best, in order to replenish the breed that is lost.

§. 11. When there is great scarcity of hay against winter, it is to be supposed that lambs will sell best, because they can live best without hay.

§. 12. In

§. 12. In years of warm-dry springs, or only of moderate rains, I observe, cattle are always cheap, because the breeding counties, which are always the barren, especially Cornwall and the mountainous parts of Wales, tumble out so many into our markets, being not able to maintain them; on the contrary, in years of wet and cold springs there is a good growth of grass in the breeding counties; therefore those counties, rather wanting more mouths for their grass, do not send them to our markets, and therefore cattle are dearer; after many dry springs, that their breed has been drained by our markets, if a cold wet spring comes, then cattle may be expected very dear, as in this year (1709) was the case; for then they can spare none. Note, though in dry hot springs there be a greater growth of grass in deep cold lands, as Somersetshire, &c. for which reason it might be thought their demand might set a good price to the Welch cattle, yet it is to be considered, that in such case the greater necessity lies on the feller; for the Welch cattle must starve, if they keep them, whereas no great inconvenience lies on the renter of the deep lands, whilst his grasses grow a little the longer only, if he keep off from buying; it is plain in this case the Welchman must buckle to; whereas in wet and cold springs, when the Welchman can keep his cattle, it is as plain the necessity lies on the buyer.

§. 13. During September, October, and half of November, fat hogs sold for 4s. 6d. and 4s. 8d. per score; but these are whey hogs, i. e. fatted with whey, and drove pretty far from the dairy-countries, which driving, and their sort of food, takes away the value of the bacon; so our hill-country bacon, where the hogs feed on corn most of the year, and are fatted therewith, yield six pence or eight pence per score the more. About the beginning of November I sold for 5s. 2d. per score, and thought the price

of eight pence per score more a good equivalent; but by the latter end of November I found the hogs fattened sold at the market for six shillings per score, at which I was surprized, peas not rising in the price; but inquiring into the reason of it, I found that our hill-country bacon seldom came to it's full price till about the latter end of November or December, when all the whey-bacon is gone, for, whilst that is plenty in the market, it keeps down the value due to the hill-country hogs, though at the same time they may yield eight pence per score more, yet seldom so much then as they do afterwards: therefore it is good husbandry not to be too ready to sell our hill-country fat hogs.

A dry summer makes young pigs dear.

§. 14. This summer, 1720, young pigs on a sudden grew dear all over England; the time they first appeared to be so was about the middle of June, and the reason for it was (as assigned by the farmers about Holt) because the last summer was as hot and dry as had been known for some years, for which reason the quantity of whey was much lessened in the dairy-countries, and the crop of corn, particularly peas, run very short; and so the breed, which would have been otherwise preserved, was sent to market for the spit.

When to buy cattle.

§. 15. If a dry spring should come, with a succeeding hot and burning summer till Midsummer, so that the first crop, or burden of grass, be lost, and being under-stocked with cattle, you have a hay-reef in store, you will have good encouragement to buy; for in such case you may buy very cheap, and will be very well paid for the hay they shall eat; for you may expect a great afterma's, the earth not having then yet exerted her strength; for the hot sun thereon will have been equal to a dunging; but then you ought to buy your cattle half fat, that your afterma's may finish their fattening.

§. 16. This

RISE and FALL of MARKETS, &c.

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§. 16. This summer (anno 1720) about a month or five weeks before hay-making, there fell so much rain in most parts of England, that the water-meadows were overflowed, and very much stranded, in-somuch that in several places they sold the hay to them who would cut and carry it off: in general they made the hay up in reeks, with design to buy-in lean cattle, after Christmases, and early in the spring, for fattening, and so to get them forward in flesh. — Note therefore, when such wet summers happen, doubtless lean and barren cattle for fattening must after Christmases, and towards the spring, be dear, because a large demand for them for that purpose may be expected.

Lean and barren cattle are dear after wet summers.

§. 17. This year (1704) there was a plentiful spring for grass, but no rain fell all June and July, and so the grass was all burned up, from whence I inferred, first, that beef and mutton would be dear by September; for by that time the forwardest beef and mutton would be spent;—secondly, that barren beasts would be scarce and dear the following spring; because, there having been plenty of grass in the spring, few beasts would * go through; —

Consequences of dry weather in June and July.

* Not proved with calf.

thirdly, that cows with calf, that had been early bulled, would be plenty and cheap at Christmases for fattening, and yet not easily to be fatted, by reason of the dry months of June and July.

§. 18. There had been (anno 1716) a cold dry spring and summer to the very autumn, i. e. the latter end of August, so that there was but a small crop of hay, and the aftermases ran very short, rain coming too late to bring it to any length before winter came, and turnips also failed; whereupon it was the opinion of both Mr. Bissy and William Sartain, two Wiltshire graziers of great experience, that beef would be very cheap till Christmases, because the graziers would sell off their beasts the fore-

Of a cold dry spring and summer.

hand of winter, though but half fat, for want of hay ; but that beef would be very scarce and dear in the spring, and the rather, because very few old cows, that have had damage, or went through, will be turned off to fatting at autumn, for want of hay ; but will be milked another year : this will also make mutton very dear at spring.

When
grafs in
plenty the
beginning
of spring,
&c.

§. 19. There is no hopes of a good year for the graziers when grafs is plenty at the beginning of spring ; for then they buy their cattle dear, and yet meat will be cheap all that summer ; for so many will buy-in for fatting, that, though the summer should prove never so dry, yet so many beasts will be made half fat by the spring-grafs, and must of necessity be fatted out, that beef must needs be plenty. — On the contrary, a good year for the graziers is, when, for want of grafs in the spring, barren cattle sell cheap, whereupon fewer buy for fatting ; and then rain coming plentifully, the beasts being bought cheap, and a scarcity of beef in course following, and the graziers having plenty of grafs to keep cattle in for a market, makes them pay well. — And note, that in wet forward springs barren cattle may be expected to be scarce and dear the year following, because beasts being well in case take bull and go not through ; the contrary may be expected in backward springs, especially when winter-meat proves scarce.

A hot and
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§. 20. Last summer (anno 1719) was very hot and dry, and so little rain fell, that the crops of both hay and straw fell so short, that the vale-farmers, for want of winter-provisions for their cattle, sold cows after Michaelmas for thirty shillings a-piece, which ordinarily were then worth 4l. per cow. — It was as forward and plentiful a spring for grafs the succeeding April and May as had been known for many years ; yet cows sold cheap, because the stock
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of cattle, so few having been fatted, was still too great; but after Christmas beef was so very dear, that, take the whole quarter of an ox, it yielded a groat per pound: bulls also were excessive dear this spring; a bull that ordinarily would yield but 40s. sold for 3l. 10s. or 4l. — The reason was, because, the wintering of cattle having been very chargeable, the bulls were supposed not to answer the charge of wintering so well as other cattle; so the farmers killed them, though but just wholesome, and sold them for a farthing, and an half-penny a pound, and eat them in their families; so the great slaughter that had been of them the winter before made them very dear in the spring.

§. 21. October and November are the cheapest times for beef, because there is then a glut occasioned by the old cows, which are turned off by the dairy at May-day to be fatted; and are killed in those two months. When beef is cheapest.

W E A T H E R.

§. 1. **T**HIS year (1712) was hitherto (June the 20th) a very hot summer; it was a dry February and March, then a little rainy the first week in April, then no rain till about mid-May, when we had a hard thunder shower, which went to the roots of the corn; then no rain till the beginning of June, when fell moderate rain, for half a day, enough to go to the roots of the corn; then no rain till this day, June the 20th, when a hard shower, of two hours, went to the roots of the corn. — This hot summer, with so little rain, had this effect upon my oats, as follows. — In November I had ploughed up forty acres of white poor land, after it was run to a thick short grass, and had laid down two years to hop-clover, in order that, after it

had laid ploughed all the winter, and took the frost and rain to flat it, the ground might be a fit and mellow bed to receive the oats ; but, notwithstanding the ground was ploughed so early, yet, being a pretty dry and mild winter, at the middle of February, when the oats were sown, the ground required much harrowing, and though they came up well and promising, yet, for want of rain to soften the ground and mellow it (having the disadvantage of being sowed on land not sufficiently loosened) they did not strike good roots, but dwindled, and by the 20th of June, when they were shooting into ear, were very thin, for want of tillowing, and were run into spindle, and looked very poor and starving.— The bad condition of these oats seems to be owing to the drought of the year, and the chalky constitution of the ground, which, being lay ground, was not sufficiently loosened, though ploughed early, and dragged in with the best management, in order to help it's natural defects ; and therefore for the future, it is to be observed, that a crop of corn sowed on such white earth, after it has laid down so long to grass, is very much hazarded in case such a hot summer happens ; whereas, if this had been the second crop sowed to oats, instead of the first, doubtless the success would have been much better ; for then such white ground, in the second year of it's tillage, would have ploughed up fine and rotten, and the oats, with the drags or harrows, would have been let in as deep as the plough went, and then, being rolled, would have endured the heat of the summer, and the want of rain, as I experimented this same year, in a crop of oats sowed in the same down, on a black rotten earth, but poor and wood-scary, which I had not thought worth ploughing and sowing ; but having sowed it to oats and French-grass from lay the year before, and the French-grass mis-

carrying,

carrying, I sowed it again to oats and French-grass: this year; the ground turned up like ashes, as deep as the plough went: I dragged in the oats and French-grass ten days after the former, yet both the oats and French-grass endured the drought and hot summer to a wonder, and held till this 20th of June, when rain came, the colour of a strong dark green. — Other fields ploughed up early for oats, after they had laid down two years to broad-clover, ploughing up pretty mellow, and, being clay-grounds, endured the heat of this summer very well, and held a flourishing colour, though sowed not till the first week in March; yet I was sensible, through the drought several of the weak tillows were lost. — But white land, as abovesaid, having laid to grass, is more difficult to be brought to a friable temper by once ploughing than the other sort of grounds here mentioned, which are of strong clay. — Also, when wheat has, the year before, been sowed to one earth, on whitish ground that has laid to grass, I observe, not only, that such ground is more apt to run to rowet in the wheaten crop (whereby the earth is more bound by the roots of the grass) than clay-ground sowed on one earth, especially if it be a little stony; but also white earth, in case it ploughs stiff, does not separate and break, when it is to be harrowed, as the clay, if a little stony; and this I plainly see by comparing together, this year, several pieces of barley.

Though our spring corn is better in cold clay lands, in the hill-country, in warm than cold wet summers, it is apparent to me, not only from this, but from many years observation, that, tho' spring corn will hold it's colour in a hot dry summer, in the hill-country, in clay lands, yet our clays are seldom so good, and of such depth as to bring to maturity, in such summers, all the backward tillows, but the

strength of the ground gives off, and the number of ears is not fulfilled, in such cases, for want of seasonable rains; whereas in rich clays of the vale, where the corn is buried deeper, possibly no summer is too hot.

Effects of a
dry spring.
How to
judge
when
French-
grafs,
wheat, &c.
have per-
fected their
growth.

§. 2. This spring (anno 1707) was exceeding dry from about the 12th of March to the 22d of May; for but one moderate shower, on or about the 13th of April, fell, which went not to the roots of the corn, for it brought up none, and but moderately refreshed any grafs. During this season the winds were very parching, the sun hot by day, but the nights cold: my French-grafs, on a burn-beaked ground, sowed the year before, was very hopeful at the beginning of March, and so on to the middle of March and the latter end of April, and looked so green, that I thought I should cut half a load at least on an acre; but from the latter end of April it began to fall off, and to turn towards a fillemot colour, and made little or no growth all the spring: on the 22d of May rain fell plentifully, and frequent rains after; I had great expectation my French-grafs would recover it's colour, and also grow in stem and length of blade, in hopes of which I waited till the 19th of June, but then found all hopes were in vain; for the grafs altered not in colour, and very little in growth, from these rains. The very same thing happened to six acres of wheat I had in very white poor ground, which having lost it's colour (being within a week or ten days of earing before rain fell) never recovered it's colour after, and put forth a yellowish and very small ear: the same happened to my French-grasses sowed the autumn before with my wheat.— From hence I observed that, when the air and the sun have concocted the juices of plants, and confirmed and hardened the fibres of the leaves and stems (which

(which the air and sun do rather in less time than they otherwise would, where there is a poverty of juices), the fibres being so fixed and hardened, that they are not capable of being enlarged, and so not to be extended by more juices, the juices struggling for a vent, discharge themselves into soboies above the roots, if the plant be perennial, providing tender juicy buds for the next year; for thus it was with my French-grafs, when I pulled up it's roots: from hence I may for the future judge when the hopes of the year are lost.

§. 3. This spring (1714) was very dry, and the summer very hot and dry; it was very observable, that the increase of rabbits, pheasants, partridges, and hares were very great, and I saw many coveys by July the 20th, near as big as the old ones; so much does the sun favour their increase in number and bulk; and doubtless the increase of the vermin that destroy them, as polecats, stoats, and foxes, hold a proportion; as such summers conduce to the destruction of the fish by reason of the lowness of the waters, so they contribute exceedingly to their multiplication and growth; the last summer being very raw and cold, the miller of Long-parish complained of the small size of his spawn, occasioned by the coldness of the season, and made it his apology for furnishing me with no better trout.

§. 4. This winter (1713) has been the driest and freest from rain and snow I ever knew, and the mildest and most moderate for frosts; and the spring was also cold, and the driest, and the summer the driest; for we had, during the whole spring and summer, but these three rains following, viz. January and February dry, March the 10th, or thereabouts, fell a rain that might possibly go to the sheer-point; then it continued dry till June the 9th, when we had such another rain as the former; it continued

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on dry with us (though some storms did scatter in several parts as we heard) till June the 21st, and 22d, when a rain fell, which I believe went to the sheer-point; and by this time the wheat was ripe in most places, and the reapers were set on the white oats, and peas were hacking, and some barley was cut; it is true, generally speaking, the last mentioned lacked above a fortnight of being ripe, the spring having been dry and cold, which kept the grain backward; black oats were fit to be cut, with me, by July the 28th.—From the account before given, of the dry winter, the cold and dry spring, and the hot summer, which periods of time, from the beginning of January to the 28th of July, being above seven months, take in only three moderate rains, it will be fit to consider what consequence is had on all sorts of corn, and the different properties of the land on which it grew.—First, as to wheat; it was generally very good throughout the kingdom, and flourished strangely on all strong healthy lands; nor did I observe any light poor lands suffer thereby, so as I could impute the weakness of the crop to the continued drought; the berry was plump and well coloured, golden coloured and not horney coloured, and no failure of chests in the ear, as there was in the last cold and wet summer; it is true, just on the hardening of the wheat the straw did, in many places, give off, so as to be struck with a blight, and felt tough and rottenish under the hook, but this was so few days before the berry was ripe, and the wheat was reaped, that the wheat being, in a manner, already ripe, the berry did not suffer thereby: what I did particularly wonder at, during the fiery trial the corn did seem to undergo this summer, was, that I had twenty acres of wheat, and the ground being of a very cold clayey nature, I had sowed the wheat under furrow,

and laid the ground round in small high ridges, of seven furrows in a land or ridge, thereby thinking to lay this cold land dry and warm, (though this land had by nature a dry situation, being on the summit of my hill-country farm) and the lands being thus laid round were so dry as to be dust, to the eye, before the beginning of June, insomuch that if I run my stick in as deep as the roots of the wheat, and turned up the earth, there was no moisture to make a cohesion, but the earth so turned up fell into the driest powder, yet did the wheat of this ground flourish, and grow proud in colour beyond any wheat in my farm, though the land was poor, under the fourth crop, and had no dung or fold to support it; and this wheat proceeded to ear, and brought me ten to eleven chests in the ears, and perfected the berry, without giving out the support of it, till harvest; and yet the earth seemingly iron whereon it grew throughout the whole summer; this evidently shews the clay land of England ought to be so prepared by tillage, that the sun may carry on it's business of burning and drying it, to the greatest degree it is capable of doing.

As to the winter-vetch crop of this year, it bore the tedious drought and heat better than the peas, wherever they both grew in land of the same kind; in hill-country land, if the mold was any ways light, weak, or poorish, they bore up against the heat, where the peas gave out, were parched up, and were lost in blossom or kid; this advantage the vetches had over the peas, by having their roots established during the winter, and by the earth's being well settled and closed to the roots before the drought came: yet I observed, where vetches were sowed on one earth, on stiff land, in our hill-country, which had laid two years to grass, such vetches did give out at blossoming time, and yielded only top-kids, and the leaf
soon

soon blighted after the blossoming time was over ; which was occasioned by such land being unfriable, harsh and churlish, and so did not close to the roots of the vetches, to keep out the scorching heat, as did the earth of mellow land, tho' not so strong ; parcels of whole land sowed in the same field, tho' of a weaker, yet of a more loose texture, did support the vetches better.

As to the peas crop this year (1714) I observed where the lands were not of a strong clayey or malmy kind, or of a fat sandy mold, they failed extremely both in halm and kid : generally all dry, harsh or hungry ground, all ground that was not well worked with the plough, or where the pea was not sowed early, to establish the root before the drought came, and blossomed late, there was a great failure both in halm and number of kids, and those kids were very short, and but two or three peas in them.

As to the black oat crop, it being generally (especially in the hill-country) sown on either light weak land, or on stronger land after it has been worn out with three former crops, and for the most part being sown on one earth, they were in general very indifferent and poor throughout the hill-country, yet being usually sowed, at least a month before the barley, their roots were so well established, and the ground so far settled to the roots, that, of the two, they escaped better than the barley, though that was sowed in much better ground ; in the vale I also observed a great failure of oats.

In regard to the barley-crop of this year, there was a great failure throughout the hill country ; for the lands there are generally of a lighter, drier, and huskier nature, and not partaking of the malmy fatness of the clays, or of the mellow, rich, hazle mold of the vales ; wanting therefore the stock of vegetable

table spirits to support the root, and not having that mellowness of parts, to clasp about and close to the roots, the barley failed in proportion as the lands did more or less partake of the aforesaid properties, or were later sowed; yet it must be granted, that in the hill-country, where was strong land, or cold clays, if the land was in good heart, worked well with the plough, and sowed early, such land bore very flourishing barley: in the vales, where the earth was of a white malmy clay, of a binding sand in good heart, or of a fat hazle mold, and in good bean and peas land, well worked, and sowed early, there was excellent barley; but wherever, in the vale, the land came short of these properties, was indifferently husbanded, or was sowed late, there was also a lamentable crop of barley.

§. 5. This year (1709) we had a cold April and ^{Of a cold} May, ^{spring.} insomuch as between Winchester and Banbury I hardly saw a good acre of corn: but, when I went from Banbury all along to Garenton in Leicestershire, I never saw better in my life (so said the country people, in those parts, of their corn) the reason of which must be, that the first lands, being poor and lighter lands, were penetrated by the colds, and had not strength to support the corn against them; but the northern lands, which were ten shillings per acre, did support their corn; therefore a cold April and May will not make a scarcity, if not wet.

§. 6. I looked on rain always to carry with it ^{Effects of} fructifying principles; yet it happens sometimes, ^{rain.} that rains, being very frequent, do beat the fallows flat and close, so as to prevent the ground from letting in the sun and air; and in that respect they may be prejudicial.

Wet summers (such as in the year 1703) keep that juice, which forms the flour in corn, watery and thin, and hinder it from digesting and fixing into a firm body;

body; and time lost is never to be regained by any plant, in any of it's progressions, whether as to it's formation of roots or fruit; there are certain progressions limited for every day in the week, as on the hatching an egg, and any interruption is a prejudice: nature will finish what she has undertaken (with very little regard to the difference of time) whether it be perfect or imperfect. — The wetness of this whole winter, which was very rainy, prevented so many grains being formed in the ear as usual; for it was matter of fact, the ears were never shorter; the wetness of May and June prevented the grains in every ear filling before it shot out of hood; for it was manifest there were four or five husks in most ears, at the bottom of the ear, which were not perfected or filled; and doubtless the remainder of June or July, if wet, will make the grain in the ear thin, and the lowermost grains more especially.

It seems a great deal of rain and wet weather to wheat in the ear, and other corn when it is high, is a prejudice; for those juices, which form and fill up the ear and grain, and fashion, and make the blade to grow, seem to be different; inasmuch as, both in corn and fruit, it is worse the wet years, when the blade and shoots run longest: when the corn is up so high, though the season of the year be hot, yet the ground is so shaded as to be in danger of being chilled by much rain; it seems the heat and power of the sun must, the whole time, attend the ground in it's incubation; for none doubts the West-Indies being better ground than England, yet runs the corn up to so mighty a stubble (to which length it cannot grow till towards the latter part before it's ripening) that to it's length, which runs so high, and keeps off the benign influence of the sun, Mr. Ray imputes the thinness of the grain.

Of a wet
spring.

§. 7. This spring (1711) was wet and cold for
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the most part of March and April, and May was also rainy ; the consequence of which, in ripening our corn at harvest, was this ; the wheat ripened, and we were reaping it by the 27th of July ; but the oats ripened not till the 18th of August, when I began to cut them ; and the barley began to ripen not till the 26th of August, when I began to cut the barley ; so there was near three weeks distance between the wheat and oat harvest, and near a month's distance between the wheat and barley harvest. From hence I conclude (as it seems to me) with reason, that the colder and wetter a spring happens to be, and the longer it continues so, there will be the longer distance of time between the wheat, oat, and barley harvest ; for the wheat being a hardier grain, and being strong and well rooted at the spring of the year, is not pinched by a wet and cold spring, nor kept back in growth, as the oats and barley are, they being tender grains and their roots weak at that time of the year ; and (vice versa) hot springs may ripen the barley before the wheat, as it stands in more need of warmth, and is more sensible of it than the last mentioned grain.

§. 8. Last winter (1702) was a very wet winter, ^{Of wet} and May and June following were also very wet, ^{winters.} which made corn yield very ill : I infer if the next winter and summer should prove as wet, and yet not wetter, corn will prove thinner, and yield worse, and be dearer than in the former year ; because that year came after a very dry summer, for which reason the corn fared the better ; but it is a great disadvantage for land to wear wet cloaths to it's back for two years together : the more years prove so unseasonable, the more and more will the land be poisoned.

It is a common imagination of the farmers in the hill-country, when much and almost continual rains fall

fall for a good part of the winter; that it will make corn dear, whereas I have commonly found them disappointed in such their expectations, and that the lands in the vale do not so much suffer, through a rainy winter, as they imagine, nay not so much as the high hill-country lands, if the ground be of a cold clay: for the vale lands, though they lie low, and thereby subject to be wet, yet, for the most part, are warm in their nature, by reason of a mellow hollow texture, whereby they soon recover and grow dry after the winter is gone off, the sun and wind piercing into them, especially if the ground of the vale be good, as it usually is much better than that of the hills: in such case, by its own vital heat and spirit it resists the chill of the winters, and soon recovers itself again; whereas lands of the high hill-country, especially the clays, being of their own nature much poorer, and more out of heart than those of the vale, do more in that respect suffer by winter cold rains, and, by reason of their heavy and close obstinate texture, do much longer retain the water in them after the rainy season is over; by which means I have often observed, that if cold rains return on the back of the former, the corn of such cold clays on the hills, being still sickly through the former wet, often dies; whereas that of the vale sooner recovering (as I said before) the chill of the former wet, has got some days strength and refreshment to bear up against the cold poison of the second rainy season which so soon returns after the former.

That winter wet is not reckoned to harm wheat by fogging the roots of it, answerable to the wetness of a March month, has this reason for it; because the pores of the roots are, in a manner, quite choaked up in the winter, nor is the winter water active, because there is not sun enough to attenuate its parts,

parts, and to make them penetrate the tubes and roots of the wheat; whereas, when the month of March comes, the sun has got strength, and has opened the porous roots of the plants, and has attenuated the juices, which are therefore drank in greedily, and at this time the sun has not yet got power enough to qualify this dropfy by it's heat, by drying up the waters, &c.

§. 9. I observed, at one end of a field, that my barley looked much more sickly and thinner (when sowed a month or six weeks) than the rest; but remembered that very patch had been dunged the year before for the wheaten crop much more than any part of the field, at which I wondered; but was told, that that patch was sowed, and before it was harrowed wet came, so that the ground was chilled and did not harrow well; so much the good condition of corn depends on these two things.

§. 10. I do conceive the coldness of the nights, (where the ground is cold clay, and the country high situated and hilly) does most contribute to the coarseness of the corn; for the summer days (tho' the coolest) are somewhat refreshing to corn as well as man, but the nights are many times of so cold a degree as to check the vegetable progression; especially, when there has been rain from a cold corner, and a cold foil for the corn, such cold of the night being of a degree beyond what the corn can support itself under, it is pinched thereby.

§. 11. On several years experience I find, that on our high hills, situated near a vale (especially in the spring time of March, April, and perhaps May, when the air is cold, dry, and windy, and of a harsh astringent temper, as usually it is at those times of the year: or, in fewer words, when the weather glass imports dry weather, for to that temper of the air I conceive the cause following is assign-

able) it is to be observed, that though there be large floating clouds boding rain, that rise and pass on one after another, watering liberally some parts of the earth over which they pass; yet that such clouds at those times of the year seldom empty themselves on our hills, but on the vales, whilst we, enviously, at a distance look on our neighbours happiness: this seems to be, because the air, being, as before mentioned, dry and thin, has more elasticity in it, and consequently gives a greater resistance to the clouds driven on by the winds, so that the clouds are easily diverted and turned aside into the stronger channel of the wind in the vale under the hills, and therefore our expectation from the clouds rising from the horizon big with rain, at those times of the year, are generally vain: whereas I observe, on the contrary, when the air is loaded with moisture, as may be sensibly perceived by the dampness of most things, and by the weather-glass being low, that such clouds before mentioned shall keep their steady course towards us, in an impartial manner, according to the tendency of the air and wind at that time; so that every cloud moves in a direct line without making a curve, or yielding to the vortex of the vale, and then we have a share of the rain with our neighbours. This seems to depend on the yielding temper of the air, whose tension, by the moisture, being unstrung, and it's elastic power being lost, the clouds meet with less resistance, and so pursue a more steady direct course, and are less drawn off and solicited by the collateral current of air in the vale, but take their course pursuant to the direction of the wind behind them, the air before them easily yielding.

Indication
of rain.

§. 12. From constant experience I have concluded, that, if the air be sultry and gloomy, without a breath of wind, or very little, the sky full of light wool-

wool-pack clouds boding no rain, yet in such cases fierce showers are very near, suitable to the gloominess and sultriness that forerun: for the clouds moving towards you, though not above the horizon, according as they are larger, stop the current of the air; whence such a closeness happens, that breathing, on such approaching weather, is not so easily performed, and from the atmosphere being full of ponderous clouds, it happens that the heat of the sun-beams, on us, must be very intense, when they are collected and contracted into narrower spaces, and either pass through the concave clouds, or are reflected from them, or break through the narrow interspace only between the clouds, which makes those scalding uneasy heats: then in such cases, tho' no threatening cloud appears in sight, yet be assured that rains are not far distant, and in an hour's time you may be likely to be surprized; then govern yourself accordingly for that whole day, whether it be in harvest or hay-making time, or when any business may suffer by rain, and lay not yourself open to the power of fierce rains to hurt you, but be on your guard, and forecast the most advantageous game you can play, on the certain expectation of hasty showers; and let not the fallacious opinion of the labourer, in harvest or hay-making, deceive you, who thinks rain is far off, because no cloud is near, and a pretty clear sky.

§. 13. It is an instance of great providence, that ^{Of rain is} in the hot climates God sends rain but seldom, ^{hot cli-} unless the first and latter rain, to bring up the corn ^{mates.} and ripen it, and to bring it out of the hose; for did it rain frequently there, as in England, &c. the corn would run up to such a height as to lodge and rot.

W E A T H E R.

§. 14. By what I can collect from the antients, they certainly thought the moon had a considerable heat, more or less, according to it's increase, or decrease, and in that sense the expression of *Columella* must be understood; — *sol & luna coquunt*, for *Virgil* applies the same to the sun,

“ *Glebasque jacentes*

“ *Pulverulenta coquat maturis solibus ætas;*”

and what else can that verse in the *Psalms* signify; “The sun shall not *BURN* thee by day, nor the *MOON* by night?” With regard to it's power and influence, sublunary things seem to have a force and strength increasing as the moon increases, and a force and strength decreasing as the moon decreases; and this is more visible or intelligible in things weak of themselves, which are more easily affected, such as are seeds sown, which are young and tender, children ill, sick persons, persons weak in their understandings, and consequently in the spirits, persons weak in their eyes, and consequently in the local animal spirits of that part, which have not a good influx; thus we see it is in a moon-blind horse; but, if ground be strong, I believe it is not much in the power of the moon to affect the seed, as strong constitutioned persons are not affected much with weather, good or bad, whereas valetudinarians must live by rule; for I apprehend the influence of the moon to be no more than what she has by her borrowed light; the increase or decrease of which, when the sun is withdrawn from us, may sensibly affect things weak, to their comfort or discomfort; and the juices in the plants and seeds, and spirits in our bodies, may rationally and experimentally enough be allowed to move brisker, or the contrary, as her borrowed light is greater or less: persons who, through a laxity of muscles stammer, are observed,
the

ENEMIES to HUSBANDRY. 389

the wind being south, or south-west, which relaxes, more to stammer; but such winds affect not the speech of other persons, who at other times pronounce distinctly.

§. 15. The wind moving the plants, and blowing them to and fro, seems, as Sir Francis Bacon ^{Of the wind.} has observed, to be the same towards strengthening the fibres and solids of plants, as exercise is to us.

ENEMIES to HUSBANDRY.

§. 1. **M**R. Bishop of Dorsetshire, his shepherd, ^{Of foxes.} and his carter told me, that in lambing-time, and whilst the lambs might be in danger of the fox, they send out a couple of fellows with horns all night to walk about, and blow and halloo, and on these nights stake down a couple of dogs, at fit distance, in a bleak cold place, which will make them bark all night; but that way, the shepherd says, will not always do, but a lamb however will be lost sometimes; nor can the same dogs abide it for above two or three nights; for then they will be so cramped as not to be able to get over a stile for two or three days afterwards: these men, who walk about, have six-pence a night, and meat and drink; they must not walk about, with a dog, for by so doing the sheep will be set o'bleating and running as much as if the fox was amongst them; so that they would not know when the fox came, which by the disturbance among the sheep may be known; nor will they, after he has been with them, be quiet from bleating till every ewe has got her lamb.

Another, a gentleman farmer of that county, assured me, he drew his flock together within two acres of ground almost as close as if he had folded them; and set four dogs, staked down at each corner,

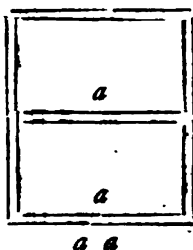
ner, to keep off the fox by barking all night, and yet the foxes stole away that night two lambs, and bit a third.

Hares.

§. 2. I observed in the barley several full-grown ears withered lying along in a track of the field, which seemed to be a great spoil; I took them up, and found the hares, to make a more convenient track, had bit the straws off at the ground.

Moles.

§. 3. The square of timbers I saw in the Isle of White, to cut mole-hills off, were six feet and a half in length, and the plate of iron about two inches broad, and sharpened as a knife is, from the back to the edge; and made after this fashion, *a* the joists, if one may so call them, across, which are sloped all away upwards, so as with the flat side they lie on the ground and are sharp; all the pieces of timber are much of the same bigness, about half a foot broad, and four inches, or better, thick, and the plate of iron set on the uppermost side of the lowermost bar, marked *a a*, hangs a quarter of an inch with the sharp edge over that bar of timber.



Mice.

§. 4. In taking down a reek-staffold of wheat, I observed (as at other times) the mice for the greatest number by much lay on the south-west side of the reek, from which corner comes most rain and moist air, of which they may drink; this reek was carried up to a center like a cockpit, thatched as well, to my neighbouring farmer's judgment and mine, as ever we saw a reek; yet these mice had opened holes in the center top, and hollowed it in such manner, in order to come at the water, that, being a wet winter and summer, much rain had fallen in and done considerable damage; so that the top thatch of reeks is to be looked after, where mice are suspected to be.

To

To my great surprize I find, that mice will not eat the hulled hop-clover seed, but will scoop out all the flour of the broad-clover seed, and, to amazement, will not leave one seed in a bushel, but what is thus scooped, in a short time.

§. 5. This day (April the 24th) I observed the ^{Rooks.} rooks, in my garden, to pull up the beans when they were come up green; they pull at the green stalk, and, if the ground be loose, the bean-seed but little wasted comes up with it. Corn was almost all sowed now throughout the country, which I believe made them apter to fall on the beans: and in the afternoon of this day I observed the barley just coming up out of the ground, and a parcel of rooks lying thereupon, with their heads going apace up and down from the ground; I went to the place, and found they had been pulling up the blades of corn, with which often, especially with a little scratching, came up the seed itself, little wasted, and only swelled, the blade but just appearing: note, my ground being rolled, they could not so well draw the grain after the blade, and on that account grew, I believe, sooner weary: the reason why they fell on the barley was, I suppose, the same for which they fell on the beans, viz. all corn being sowed, they could, for a few days, make better wages in fishing after the corn thus than in looking after the loose grains above ground.

In Wiltshire, at Holt and thereabouts, I observed boys keeping off rooks from peas in the fields after they were come up; upon inquiry I found it was necessary, if peas came up before other corn was sowed, which was usual in those parts. It is not so in our hill-country, because we are sowing black oats in abundance before our peas appear; but if I sow the great corthill-pea, which I intend to do, which must be sowed very early, and come up before other

corn is sowed, I must have; I find, the rooks kept off, or else, if I should go from home for three or four days without taking care about it, they may be all pulled up before I return.

Rooks and
pigeons.

§. 6. The destruction that pigeons and rooks make is incredible; a neighbouring farmer assures me, that he has known an acre sowed with peas, and a rain coming so that they could not be harrowed in, every pea was fetched away in half a day's time by the pigeons.

I sowed wheat very early (viz. by the 3d of August) which was before the wheat harvest opened; the rooks, having no other corn to prey on, laid on it, and devoured a great quantity: but they do most harm, when, in the winter-time, the snow lies on the green wheat, and is first going off; for having had no food for some time, they fall then very greedily on the wheat.

* Rooks, if they infest your corn, are more terrified, if in their sight you take a rook, and, plucking it limb from limb, cast the several limbs about your field, than if you hang up half a dozen dead rooks in it; this Mr. Ray says in two or three leaves of Remarks on husbandry, fol. 194, in his Etymology of words.

The grain of my wheat began to harden in the ear, and the rooks to gather to it: I was saying to my bailiff, that it would be hard to keep them from it, unless two men compassed it with guns; but he answered, it was a field of whose haunt the rooks might be easily broken, for, said he, there is only a dead hedge for a few* lug on one side, all the rest is

* Fole.

* Among the many contrivances to frighten rooks, says Mr. Tull, as feathers stuck up, the limbs of rooks scattered about the ground, dead rooks hung on sticks, the gun, or a boy to halloo or throw up his hat, or a dead rook in the air, I have found the last to be the most effectual.

quick

quick hedge, and if you frighten them there, they will fly off to another haunt; a rook does not like to come to corn, but where there is a dead hedge, for they must be out upon the watch (and they do not care to light upon a quick hedge) to tell tidings; but crows will often light on the quick: I observed this year towards harvest, that the rooks gathered much about those corn grounds where my ponds were, to rendezvous and drink, and so to the corn again; therefore break them of their haunts early there, before the corn ripens.

Rooks will not pull up the lenten corn till seed-time is over, and there is not grain for them; and they seldom care for peas in the grain, nor barley as long as they can come at oats: for the oat stripped of its husk is much sweeter, and tenderer to be bruised than barley, but when it comes up into blade, then they will most fall on barley; being last sowed and a fuller bodied grain, there is more flour left in the barley than in the oat; when they fall on the barley in the ear it is in light ground that is hollow, where it is * more-loose; if peas were sowed late, without doubt they would sooner fall on their blade, and pull them up than other corn, because of the bulk of their grain, in which there is more flour to be found unexhausted; and I do remember, they fell on goar-vetches, that were sowed in May, with that voraciousness that it was very hard to secure half of them: in some grounds, which they take to, one may gather in the compass of a yard a handful of blades they have pulled up: — it is true, pigeons love peas best, which may proceed from the weakness of their bills that they cannot unshell the oat, and from the heat of their crops, which may digest a pea better than the rooks can.

It had been an excessive dry summer from April to this day (7th of July) and tho' there were no worms nor bugs, by reason of the drought, to be met

met with, yet the birds did not fall on the cherries, which I and others wondered at, but probably it was because there was so much corn sown about the house: but, where the summer is so very dry that rooks cannot come to worms, nor the plough go to turn them up, they will fall on the corn before it is half ripe, even when they can have but a green juice in the straw to chew, therefore are to be prevented.

Rooks and
sparrows.

§. 7. A farther evil there is in rooks, that their nests, when their breed is over, is a harbour to the latter brood of the sparrows, which bird chooses then, when the weather grows warm, and the air mild, to build sub dio, and not to stive herself up in nests under the eaves of a house.

Snails.

§. 8. In September I found many snails eggs laid at the roots of plants I pulled up: the 21st of October in rainy weather I observed a multitude of white snails or slugs, crawling on the ground, under the cabbages in the garden, most of which were not half so long as my nail, and in thickness no bigger than a pin's head; so that I concluded them newly hatched from the September eggs; therefore it is seasonable to destroy the old ones before September, in order to destroy the brood. *Quere*, if they lay eggs any other months of the year; if so, to be chiefly taken off before such laying also.

In February I planted cabbages, and by the latter end of March had most of them eat up by white snails, or slugs, of which sort of snails we picked up a quart or more in a morning early for many mornings; the country was this year much infested with them; this evil seems to have proceeded from the very mild winter, which did not destroy the eggs they lay every autumn in abundance at the roots of all manner of herbs: the same is to be expected another mild winter, therefore look after them early in the spring.

Worlidge (fol. 262.) says, that snails are of both
sexes,

sexes, and couple from spring until Midsummer and after, and lay their eggs in the ground; you will find them with their bodies buried in the warm dust, and only their shells above the ground; when you take them out you must rake out their eggs and destroy them, or else some will be hatched the same year, and some in the spring following.

§. 9. Ants, in the hotter regions, are reckoned ^{Ants.} among the pests of the field, as in Italy, Spain, and the West-Indies. Mortimer, fol. 253.

One Timothy Skrine (a very industrious and laborious person in planting orchards, and my neighbour in Wiltshire, who from an estate of ten pounds per annum, improved it that way to fifty pounds per annum) came to see me in Hampshire, and walking out with me in my meads, and observing the emmet-casts, he told me, he had tried many ways to destroy them, being much troubled with them, and particularly the opening their hills in winter, which they would rebuild again; (I suppose at winter they lie lower than people usually dig after them, therefore that way is unsuccessful); but that the best way, as he has by experience found, is to sling abroad their hillecks in the month of June, in their breeding time, when they lay their eggs, before they come to be flies: I suppose this destroys their breed, puts them on endless labour to find them out, till they are hunger-starved, and, the brood being destroyed, the old ones (who are not, I imagine, long-lived) decay, and die in a short time; or perhaps they leave their habitations out of resentment for the cruel usage of their young, God having with his first blessing at the beginning implanted in all creatures an earnest desire of propagating and protecting their species; and we see the most fearful of them will venture their lives for their young ones; and it has been known, when persons would destroy rookeries
by

by firing at the old ones daily, it could not be done, but, when the nests with young ones have been brought down, and burned under the trees, they have all deserted.

Worms.

§. 10. I made a gravel walk in my garden, and underlayed it with white mortar earth rammed in, and layed strand on it; both coats were above a foot thick, notwithstanding which the worms, in a few days time, made their holes through; I cannot suppose it possible for the worms to thrust or bore through such a solid with their snout; but having observed what a power they have with their mouth to pluck at grass, do believe, in the same manner they use their mouth in pulling away the earth in little crumbles, which they still tumble downwards under them.

I made a little court with a gravel walk in the middle, and grass-plots of turf on each side of the walk: the worms came through the turf in vast numbers, and were very hurtful to it; the days being very rainy for a season, which brought them out at nights; my servants visited them with candle and lantern, and caught great quantities of them, till at length they grew so cunning that on stepping on the turf, though at a great distance, they would feel the turf shake, and shoot into their holes; besides, they would not, at their usual hours, come out of their holes, nor then, as they usually did before, lay out with most part of their bodies, but with their noses only: observing the improveable wisdom of these insects, I thought to be cunninger than they, and made sure of taking those that lay within my reach on each side of the walk; for the gravel walk laid lower than the turf, and, being a solid, did not shake the turf, so I carried, as I stood in the walk, my candle and lantern over the turf as far as I could reach, but the worms being used to the light shot
into

into their holes as soon as ever the rim of light came over them ; I suppose they have no eyes, but God has given them an exquisite feeling to supply that defect, in many respects, in order to self-preservation. Light being a fluid body makes a different configuration of the particles of the air, which they can distinguish by the feel as a blind man can by use some colours ; at last I found the way to destroy them was, to visit them very early in the morning, in copulation, when I found they had a stupor ; which puts me in mind of that saying of Pliny, *omne animal post coitum triste*.

I have a clay so obstinate about my house, for a quarter of a mile's compass, and withal so flinty, that I am sure a mole could never come within that space, and yet, if a stick be put in any place and stirred about, the worms will rise and come forth, for fear of the mole, which seems to be purely owing to the enmity God has set between the worm and the mole from the beginning ; for it must proceed from somewhat innate, that a creature, which had never, in the grounds here mentioned, experience of harm in this kind, should blindly use this stratagem.

It is a common proverbial saying of the countryman, that at whatsoever country-farm a colony of rooks planted themselves, and made a rookery, it is a sign of good luck and good fortune attending that man ; and on men growing unfortunate and low in the world, the rookery has been observed to forsake such farm : for both which observations some good reasons may be offered ; viz. it is certain where a man is a good husband to his land and improves it, the worms also (a great food to these creatures, especially at some times of the year) multiply, and grow also to a much greater bulk and fatness ; the strength of land being discernable by the large size of worms

as

as from the growth of plants, and the beetle kind, on whose grubs or maggots, therefore called rook-worms, the rooks do greatly feed, (as is apparent by their following the plough) do not only grow in such ground much fatter and larger, but those flies of the beetle kind, by the wisdom God has given them, do covet and choose to nest their fly-blows in such land as will best nourish and provide for them; and the same instance of the wisdom of these creatures may be given in many like cases; but, where an ill husbandman comes, the contrary to this soon comes to pass, upon which, no wonder if they say, let us go hence.

Upon viewing a farm in the Isle of Wight, to purchase it, we were afraid the farmer, according to the liberty he had by his lease, would have ploughed up the cow-lease; farmer Collins said, if it was his he should hardly do it; for, said he, good sweet cow-pasture ground, that has laid to grass a long time, is (in the Isle of Wight) very subject to the worm, which will eat up the corn; it was a surprize to me to hear him say so, and therefore I enquired more particularly about it; he said, the worm was very small, with a black head, like a fly, and when their wheat, about March, should promise exceeding well, it would die away on a sudden; take up such green wheat by the root, and just above the root and grain, within the earth, one may observe the stalk almost bit in two, and very commonly the worm upon it, and fresh ground is very subject to it, for the two or three first crops; I asked him if it ever sared so with their barley; he said, he never knew the barley to receive damage by it, but he had known the peas receive the same damage as the wheat. Mr. Rowler, an experienced yeoman, was present, and confirmed what Collins said.

ENEMIES to HUSBANDRY. 399

§. 11. If ground be infested much with rook-worms, ploughing it up will cure it of them for some years. Rook-worm.

§. 12. I was at lord Pembroke's, and his lordship was discoursing about insects and their eggs, and propagation; he said, that many of their eggs which were laid late, did lie out all the winter, and were not brought to perfection till spring; therefore it is observed, that, where there is a cold winter, there is a less increase of those insects. Of the eggs of insects.

§. 13. The wisdom of God is very manifest in that contemptible insect we call a maggot, and in the fly that blows it in the nut: I do not remember that ever I saw two maggots in a nut, though most nuts in a bunch are faulty where one is so; it seems the maggots of the whole bunch are the blowing of one and the same fly, and that all the nuts of the same bunch would have been blown, if some accident had not disturbed the fly at the time of her incubation, for that a flesh-fly does at the same time lay many eggs is certain: again, it may seem strange, that one and the same fly should discern (it being an act of almost the same instant of time) where she blowed her maggot, so as not to lay another in the same nut; yet it seems stranger, that every other fly should discern where a former had blown a maggot, so as to avoid laying her fly-blow on the same nut; otherwise it would afterwards happen that many maggots would be in the same nut, and the provision of maintenance fall short: where the fly-blow is injected, when the nut is very small and tender, a canker grows over and closes, and consists of a rotten substance; and here it shews wisdom also in a maggot, that it can discern that easier place of entrance. Nu-mag-got.

§. 14. I observed this day (the 11th of August) a multitude of young caterpillars on the leaves of Caterpillars.
my

my turnips half-grown; all the said half-grown leaves they had almost eaten up: note, the summer being very hot from April to this day, I conclude the latter brood of autumn was ripened also the same year, the eggs of which would otherwise have laid in the ground till next winter, these will be destroyed the next cold rains: from hence I conclude we shall have the fewer insects next year: it was a new thing to me at this time of the year to meet with such an enemy.

I observed this year (1709) in my walks among apple-trees and codling-hedges, that some apple-trees were smitten with the blight, as the country people call it, when their leaves are eaten up with the caterpillar, whilst I observed that the rest were under a flourishing and green verdure, and untouched by the caterpillar; and I was told by the owners that such trees were most years smitten; this occasioned some speculation and scrutiny, but I soon judged the reason of it; for I perceived a difference in the colour and shape of the leaves, between the blighted and unblighted trees, and upon inquiry found them to bear different fruits, and, if of the same sort there were any blighted (which rarely happened when others escaped) I found, by reason of the different ages or unthriving condition of these trees, they had put out their leaves earlier or later than the others, and soon perceived that some trees, by bearing sweeter leaves than others, were more suitable to the tooth of the caterpillar, or by bearing earlier or later, were more suitable as well as more tender at the time the caterpillar was to be fed, and that such fly laid her eggs on such trees (by the wisdom appointed such insects by Providence) on which the worm (i. e. the caterpillar) when hatched and grown to maturity, might have it's best maintenance.

ENEMIES to HUSBANDRY. 491

§. 15. A notable fellow (though a labourer only) in husbandry, drove a yoke of oxen from the neighbourhood in Wiltshire where I have concerns (viz. Bradford and Trowbridge): I walked him about to shew him my corn, and an occasion offered to discourse on peas: I asked him if they were not often eaten up by a caterpillar in Wiltshire; he said, in case the peas grew into a good halm, and blowed well, they never doubted a good crop of peas in their neighbourhood, for he never knew peas hurt by caterpillars in their country; but about fourteen years ago there was a winged fly, a sort of locust, which did them damage: I replied, I supposed they sowed peas so early as to escape the danger of the caterpillar by their forwardness before that insect came; he said, that was not his meaning, but the true reason for the escape of the peas, about them, was, because so many elms, maples, and oaks grow about their grounds, which the fly (the parent of the caterpillar) who knows the tooth of her brood, prefers before the pea, and in the leaves of the said trees lays her eggs: I take notice of this, because it is agreeable to my own observation in former papers. And here the hand of God is very wonderful, to instruct the butterfly to choose such plants, to lay it's brood in, as are best suited for their nourishment, whereas the butterfly judges not of it, nor chooses it, by taste, leaves of plants not being the food of those flies, but the juices of flowers and honey-dews.

§. 16. The green-louse or locust falling on the broad side of the pea-kid, and thereupon the grain not thriving, seems an argument that the sap, which nourishes the pea withinside, is conveyed to the grain, and strained through the fibres of the kid: for otherwise there is no reason why the pea should suffer by this, seeing the spine, to which the pea adheres by a thread, is preserved entire, and is joined.

to the main stalk; through this, therefore, the sap might be conveyed directly, and without any prejudice to the pea, were it not first to be strained through the fibres of the flat side of the kid. — This to be referred to what Malpigijs has said of the sap's circulating through the leaves to the fruit.

The 13th and 14th of June, in pulling up wheat in ear, and fowthistles, I did observe among the upper part of the roots of most of the wheat and fowthistles, knots or clusters of grass-lice, or green locusts (though these appeared whitish, being underground, and as yet but just come to their shape) and amongst most of these clusters I observed a fly at her incubation, which seemed very turgid of a whitish matter, she being then blowing these insects; her wings were black, and the fly was plainly the same as the locusts, only it had wings: I found at no root more than one fly.

Cuckow-
spit.

§. 17. On May the 22d was the first cuckow-spit I had observed, which was on a woodbind joint; till within a day or two of that time there had been no rain or dews all April and May, and so whatever insects of that kind were laid in the joints of plants could not live, but must be scorched up.

In the history of Works of the learned, for April 1707, I find Monsieur Poupert has given an account of the cuckow-spit, or spring-froth; he says, as soon as the little creature comes out of it's egg, it goes to a plant, which it touches with it's fundament, and fastens there a white drop of liquor full of air; it drops a second near the first, then a third, and so on, till it covers itself all over with a scum, or froth; this froth keeps it from the heat of the sun, or spiders that would suck it; note, this is not agreeable to my observation made in another place, nor can I agree with Mr. Poupert: for it is nothing but the nightly dew, which falls on the fork, or joint of the
the

the plant, which the little insect with his proboscis, as with a bellows, works into froth.

§. 18. Being acquainted that a great blight was upon the apples, where I observed no leaves eat up by the caterpillar, I judged such blight must be of another sort, and upon enquiry (when none of the apples were bigger than gooseberries, and the more backward much less) I found this blight was on the blossoms; for I found the blossoms had been closed up, and a cement bound the rims of their leaves together, and in the hollow inclosure was a fly, brown, and of a hazle colour, of hard wings like the beetle kind, of legs not shelly like theirs, and more nimble, of a neck as big as horse-hair, and as long, near, as his body, at the end of which he bore a very small head between two slender horns: where these blossoms were scorched up by the sun and looked black, by reason of the time which had passed since their more early blowing, there I found the fly perfect, as before described; but in those blossoms whose leaves were less dried, scorched, and sun-burnt, which I took to be blossoms of more backward trees, there I found the fly as yet imperfect and unripe, with a yellow soft skin and helpless, but in a quick motion of it's body, it's legs and wings being as yet swathed up in this outward coat, which was by heat to ripen and crack: I perceived, by the degrees of the forwardness and backwardness mentioned of this insect, that the fly which blowed them, must have several days for reigning, to do this mischief, distant in time from each other: it was no cobweb as I could find, that cemented these leaves together as above mentioned; but I conceive it to be done by the heat of the sun drawing away the tenuous parts from the dew of the flower, whereby the gummy substance quickly joined these leaves: it may be the fly took a blighting mildew

Of the fly
in apple
blossoms,
&c.

air for the doing it : I believe this mischief was done before the blossom opened itself fully, because the closure and figure of it was in all like a blossom whose leaves close at top before they are expanded. When the insect grows to maturity, he eats a hole and goes forth : a vast miscarriage fell on the fruit this way, more than in all other ways besides ; I found it the same in all gardens and orchards. Note, coftermongers and cyder-men may enrich themselves by an early foresight of this, by buying up the apples ; for the scarcity is to be foreseen before the flower is full blossomed, whereas we do not usually understand this mischief till it is obvious to every eye.



Expla-

Explanation of Terms in Husbandry, used in the foregoing Observations.

A.
AFTERMATH. Aftermath, lattermath, second crop of grafs mowed in autumn.

Ans. Of each an equal quantity.

B.
Brashy. Full of small stones.
Barton. The yard, the farm-yard.
Burnbeak, burnbase. To cut up the turf, and burn it in hislocks on the land.

Brit. To shed, to fall.

Backside. Farm-yard.

Bennets, bents. Spiry grafs running to seed.

Benneting-time. When the pigeons eat the grafs-seeds.

C.
Cotyledones. Rinds, husks.
Chitt. To sprout out, to grow,
Chafe-row. In planting quicksets a single chafe is a single row; a double chafe means another row planted below the first, not directly underneath the upper plants, but under the middle of the intermediate spaces.

Chiffum. To put forth roots, to grow.

Cues. Shoes for oxen.

Chocky. Chalky, dry.

Couples. Ewes and Lambs.

Cow-lease. See Lease.

D.
Declivous. Shelving, sloping.

E.
Earth. To one, two, three earths; to plough the ground once, twice, or thrice; to sow after one, two, or three ploughings.

Edge-grown. Coming up uneven, not ripening all together.

Erthe. Stubble.

Elm. See Helm.

F
Fallows stale. Ground that has been ploughed some time, and lies in fallow.

Flue. Weak, sickly.

Finnowy, vinnowy, vinnowed, vinney. Mouldy.

Foliomort, fillimot. Colour of dead leaves. Reddish yellow.

Fusty. Musty.

G.
Gripe. Armfull, from Gripe.

Grip. To lie in grip; to lie on the ground, before it is bound up in sheaf.

Grip. To grip, or grip up; to take up the wheat, and put it into sheaf.

Gnash, Crude, raw.

Grete, Mold.

H.
Hulls. Chaff, the hull, the rind.
Helm. Halm, or straw prepared for thatching.

Helm. To helm, to lay the straw in order for thatching.

Heirs. Young trees in coppices.

Hayn, or hayn up. To hedge in, to preserve grafs grounds from cattle.

Heal. To cover in; to heal seed with harrows, to cover it in.

Hee-grafs. Stubble of grafs.

Hog-sheep. Young sheep.

Hog-fold. Fold of young sheep.

Hint. To lay up; to put together.

Horse-lease. See Lease.

I.
To joist. To take in cattle to keep at a certain price per head or score.
Idiosyncrasy. A peculiarity in nature or constitution, a temperament whereby an animal body hath a peculiar inclination to, or aversion

aversion against, [some particular] difficult to be avoided when the land is ploughed dry.

K.

Knot-fine. Very fine. To knot fine, to turn up fine under the plough.
Knotted sheep. Sheep without horns.
Kittle. Subject to accidents, uncertain.

L.

Lugg. A pole in measure, 16½ feet.
Leaf, lea, lay, ley. Grassy ground, meadow-ground, unploughed, and kept for cattle.
Linchets. Grass-partitions in arable fields.

M

Mores. Roots.
More-loose. Loose at root.
Mamocks. Leavings.
Malt-rashed. Overheated, burnt.
Meliorate. To enrich, to make better.
Mixen. Dung, dunghill.
Muck. Dang.

O.

Oughts. Leavings.
Oils. Barley oils, the beard or prickles.

P.

Præcocious. Early ripe, forward.
Pitch. To waste, sink in flesh.
Fur-lamb. Male-lamb.
Peal. Loose its hair.

R.

Rath-ripe. Early ripe, rather, sooner.
Rashed. See Malt.
Rime. Hoar-frost.
Rowet, rowen. Winter-grass.
Rafty. Rusty.

S.

Sull.
Spalt. To turn up; it spalts up from below the staple, i. e. the bad ground turns up in ploughing from below the good mold, which is

Suant. Kindly, even, regular. Probably from the French word *Suivant*.

Shutes. Young hogs, or porkers, before they are put up to fattening.
Stale-fallows. See Fallows.

Soboles. Buds for the next year's increase.

Succedaneous. Substitute to, or supplying the place of something else.

Sheep-flate. Sheep-walk, sheep-leaf.

T.

Tine. Tooth or spike. To give two tinings, three tinings, &c, to draw the harrows over the ground twice or thrice in the same place.

Tilt or Tilt. See Earth. To give land one, two, or three tilts, is the same as to plough to one, two, or three casts.

Tilt or Tillage. To be in good tilt, is to be in good order, or in good tillage.

Tillow. To spread, shoot out many spires.

Trig. Firm, even.

Thorough. To go thorough, not to prove with young.

Tupp. Ram.

Tapping-time. Ramming-time.

Thief. Young ewe.

V.

Vetches-goar. Early ripe, or summer vetches.

Viliorate. To make worse, impoverish.

Vinnow. Mouldiness.

W.

Woodfeer-ground. Loose, spongy ground.

Warp. Miscarry, sink her calf.

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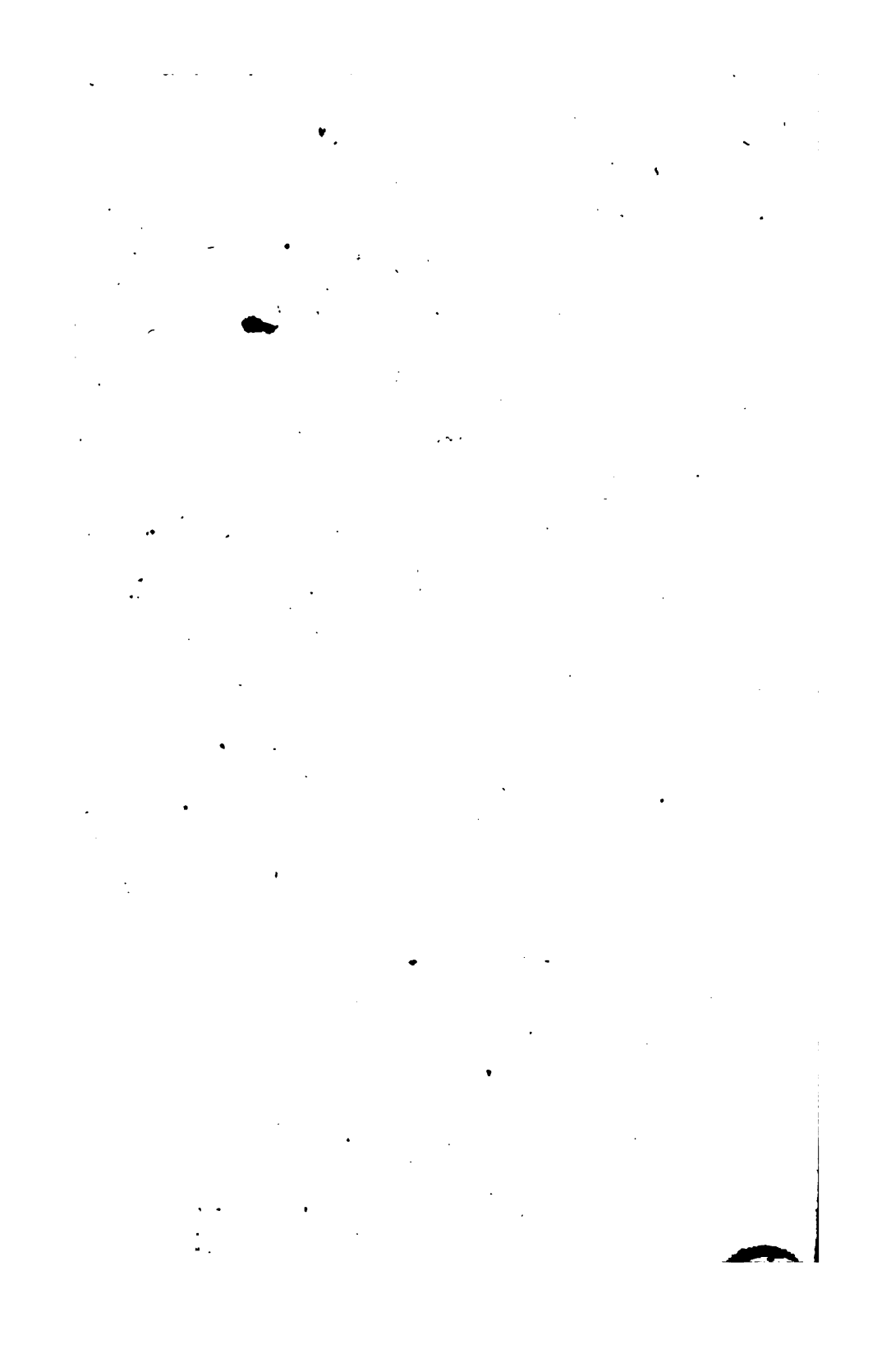
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